

MITIGATION PLAN FOR THE COVE SPRING STREAM RESTORATION PROJECT FRANKLIN COUNTY, KENTUCKY



Prepared for:

**Kentucky Department of Fish and
Wildlife Resources
Frankfort, KY**

**City of Frankfort Parks and
Recreation Department
Frankfort, KY**

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COMPLETED BY BIOHABITATS, INC. (2009)

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Attachment 5 - Cove Spring Stream Aquatic Assessment Report
Completed by ETC (2008-2009)

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1. Introduction

As agent for the Kentucky Department of Fish and Wildlife Resources (KDFWR), Stream and Wetland Mitigation Program, and the City of Frankfort Parks and Recreation Department (CFPRD), Eco-Tech Consultants, Inc. (ETC), in coordination with Biohabitats, Inc., hereby submits this U.S. Army Corps of Engineers (USACE) Department of the Army (DOA) Pre-Construction Notification (PCN) for activities to be conducted under Nationwide Permit 27 and a Kentucky Division of Water (KDOW) Water Quality Certification (WQC) application (Attachment 1). This mitigation plan was prepared for a stream and wetland restoration project located in Cove Spring Park, Franklin County, Kentucky (hereafter referred to as Cove Spring Restoration Project).

1.1 *Description of the Activity*

The project encompasses Cove Spring Run in the City of Frankfort's Cove Spring Park and Penitentiary Branch below the mouth of Cove Spring Run downstream to the Jones Run pump station and levee. It also includes a portion of a small tributary in Cove Spring Park called Holly Branch. Anthropogenic impacts in the stream corridor include a historical dam (now breached) in Cove Spring Park, numerous bridge crossings, Jones Run levee, upstream development, and floodplain encroachment by business, residential and park-related structures. Natural influences affecting the stream include the limestone bedrock, which forms two steep drops in Cove Spring Run, dam-building and other activities by beaver in Penitentiary Branch, and backwater during high flow events in the Kentucky River.

The upper reaches of Cove Spring Run are bound by steep valley walls with evidence of a high load of coarse colluvial and alluvial limestone sediment. In Cove Spring Park, a portion of the stream's flow is diverted for approximately 2200 feet through a trout raceway and artificial waterfall. Although trout farming does not occur, the waterfall is maintained for aesthetic purposes, and during dry periods the diversion captures all stream flow from its origin at an upstream spring box. The main stream channel exhibits intermittent flow above this waterfall. Historically, Cove Spring Run has been moved throughout much of its length and diked in some places since elimination of a former reservoir impoundment. Some sections of the riparian corridor have been cleared, and the stream channel is unstable throughout portions of the project area.

Cove Spring Run flows into Penitentiary Branch, which is located in an abandoned historical meander of the Kentucky River. Penitentiary Branch is hydraulically controlled by the levee used to help manage Kentucky River flood waters. Existing and historic beaver activity has additionally resulted in significant alteration of the natural hydrologic regime at the site. Beaver dams were responsible for increased in-channel water depth, greater flow retention, raising of the water table, and deposition of excess sediment. These alterations resulted in the development of fringe and floodplain wetland characteristics within the portion of the project area that is downstream of US 127.

Biohabitats, Inc. serves as the design engineer for this project and was tasked to provide a plan that includes restoration initiatives such as stabilization of head cutting and lateral cutting stream reaches, increased filtration of stormwater, and enhancement of existing habitat. ETC

assisted in the development of a planting plan, baseline biological assessment, determination of jurisdictional waters, and permit application preparation.

1.2 Identification of Responsible Parties

Applicant:

Kentucky Department of Fish and Wildlife
Resources
Stream and Wetland Mitigation Program
#1 Sportsman's Lane
Frankfort, KY 40601
(502) 564-7109
Nick Ozburn, Project Manager

Through a Memorandum of Agreement with:

City of Frankfort
Parks and Recreation Department
800 Louisville Road
Frankfort, KY 40601
(502) 803-0764

Andrew Cammack, City Representative

Agent:

Eco-Tech Consultants, Inc.
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(502) 695-8060
Lee Droppelman, Principal Scientist

Contracted by:

Biohabitats, Inc.
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(502) 561-9300

Mike Lighthiser, Senior Design Engineer

2. Site Characterization

The Cove Spring Restoration Project is located approximately two miles north of downtown Frankfort on the Frankfort East, KY USGS 7.5-Minute topographic quadrangle map in Franklin County, Kentucky (Figure 1). The approximately 100-acre site is located on both sides of US 127 at its intersection with US 421 within Frankfort city limits. The project encompasses Cove Spring Run in the City of Frankfort's Cove Spring Park and Penitentiary Branch below the mouth of Cove Spring Run downstream to the Jones Run pump station and levee. It also includes a portion of a small tributary in Cove Spring Park called Holly Branch.

Watershed

Penitentiary Branch, a fourth-order stream, falls within the watershed of the Kentucky River, below Frankfort (8-digit HUC 05100205, 11-digit HUC 05100205250, 14-digit HUC 05100205250010) (Figure 2). In general, streams within the project flow in a west to southwesterly direction. The furthest downstream design reach has a surface watershed size of 8.75 km² (3.38 mi²), with feeder streams consisting of intermittent and ephemeral channels. Penitentiary Branch receives an extensive amount of flow from Cove Spring and other springs. Therefore, the drainage basin size is significantly greater than would be expected from drainage basin size calculation based solely on surface water drainage.

Ecoregion

Land within the watershed of Penitentiary Branch is largely forested. However, it also receives unfiltered stormwater runoff from urban paved/manicured areas that make up a substantial portion of its drainage basin. The Cove Spring stream restoration project area falls within the U.S. Environmental Protection Agency (EPA) Hills of the Bluegrass Sub-Ecoregion of the Interior Plateau Ecoregion (Woods et al. 2002). According to Woods et al. (2002) the mostly forested Hills of the Bluegrass are underlain by Upper Ordovician calcareous shale, siltstone, and limestone. The physical characteristics of its rock formations are unlike the three surrounding ecoregions. Its upland soils are fairly high in phosphorus, potassium, and lime but are not as naturally fertile as soils found in the Outer Bluegrass, and Inner Bluegrass which support young, mixed forests rich in white oak, hickory, and cedar (Woods et al. 2002).

The Hills of the Bluegrass has steeper terrain, soils more prone to drought, lower soil fertility, higher drainage density, and more erosion-prone than Outer Bluegrass, and Inner Bluegrass (Woods et al. 2002). As a result, less than ten percent of this ecoregion is suited to row crop agriculture and the rest is wooded, pastureland, or hayland. Stream nutrient levels are within the Hills of the Bluegrass are generally lower than in the Outer Bluegrass, and Inner Bluegrass (Woods et al. 2002). Its upland streams are often intermittent with cobble, boulder, or bedrock substrates and gradients are steeper than in the Inner Bluegrass (Woods et al. 2002). In addition, fish and macroinvertebrate communities are similar to the Outer Bluegrass and Inner Bluegrass but also have elements that are distinct from Knobs–Norman Upland (Woods et al. 2002).

Cove Spring Park is largely forested, but also includes manicured park lands, trails, and paved roads (Figure 3). Climate and growing season in Cove Spring are typical of the eastern temperate United States (Tables 1 and 2).

Table 1. Natural Resource Conservation Service (NRCS) climate data for Franklin County Kentucky (NRCS 2003).

Month	Temperature (Degrees F.)			Precipitation (Inches)				
	Avg Daily Max	Avg Daily Min	Avg	Avg	30% Chance Will Have		Avg # of Days w/ .1 or More	Avg Total Snow Fall
					Less Than	More Than		
January	40.9	21.5	31.2	3.11	2.03	4.01	5	3.7
February	45.9	24	35	3.01	1.98	3.61	5	2.3
March	55.9	31.5	43.7	3.95	2.7	4.6	7	0.3
April	66.2	39.9	53.1	3.67	2.41	4.48	7	0
May	75.1	49.9	62.5	4.61	3.25	5.42	8	0
June	82.9	59.2	71.1	4.36	3.31	5.6	7	0
July	87.4	64.1	75.7	4.18	2.91	5.16	6	0
August	86.2	62.4	74.3	3.56	2.45	4.43	5	0
September	80	54.9	67.5	3.15	1.81	3.54	5	0
October	68.9	42.4	55.7	2.66	1.72	3.19	5	0
November	56.4	34.1	45.3	3.33	2.28	4.2	6	0.1
December	45.7	26.2	35.9	3.66	2.47	4.39	6	1
Annual	-	-	-	-	38.81	45.16	-	-
Average	66	42.5	54.2		-	-	-	-
Total	-	-	-	43.25	-	-	72	7.4

Table 2. Natural Resource Conservation Service (NRCS) growing season data for Franklin County Kentucky (NRCS 2003).

Probability	Temperature		
	24 F or higher	28 F or higher	32 F or higher
	Beginning and Ending Dates		
	Growing Season Length		
50 percent *	3/27 to 11/13	4/ 7 to 11/ 2	4/19 to 10/19
	231 days	209 days	183 days
70 percent *	3/24 to 11/16	4/ 3 to 11/ 7	4/15 to 10/23
	238 days	218 days	191 days

* Percent chance of the growing season occurring between the beginning and ending dates.

Soils

The Soil Survey of Anderson and Franklin counties indicate that Cove Spring Park is underlain by Elk, Fairmount, Lindside, McAfee, and Newark soil complexes (McDonald et al. 1985). Most of the delineated wetlands occur within Lindside (Ld) and Newark (Ne) silt loams. Newark silt loam is found on the National Hydric Soils List (NRCS 2008). A brief summary of all soils found in Cove Spring Park is included in Table 3. Observed soil profile descriptions are included with the Wetland Data Forms (Attachment 6).

Table 3. Summary of soils located within Cove Spring Park.

Soil Series	Location	Permeability
Elk silt loam (EkB) – 2 to 6% slopes	Well drained soil on intermediate stream terraces	Moderate
Fairmount-Rock outcrop complexes (FcE and FcF) – 12 to 60% slopes	Well drained soil on moderately to very steep slopes	Moderately slow to slow
Lindside silt loam (Ld) – occasionally flooded	Moderately well drained soil on floodplains	Moderate to moderately slow
McAfee silt loam (McC and McD) – 6-20% slopes	Well drained soil on ridgetops, shoulder slopes, side slopes, hillsides, and karst	Moderately slow
Newark silt loam (Ne) – occasionally flooded	Somewhat poorly drained soil on floodplains	Moderate

Aquatic Ecology

No instream chemical data were collected for this project. However, indices derived from fish and aquatic macroinvertebrate community assemblages indicate that, when compared to other Interior Plateau Bluegrass Bioregion reference sites with similar watershed size, sample sites within the project area scored from “Very Poor” to “Fair”. These low KIBI and KMBI scores suggest a loss of biological integrity within the fish and macroinvertebrate communities located within the park. Overall ratings of poor mean that Penitentiary Branch lacks sufficient water quality to support a diverse and healthy aquatic fauna. This reduction in water quality may be attributed to many factors such as riparian vegetation loss, pollution, stream channelization, increased storm water runoff urbanization, and an unstable substrate/habitat (Biological Assessment Report - Attachment 5).

Geomorphology

Through much of the upstream portion of the site, alluvial fan-like deposits of limestone cobble and small boulders at the base of the cliffs, with the largest extent at the uppermost section, near the spring box were observed. This material appears to deposit in the stream during large storm events, resulting in a dynamic, braided channel (Rosgen D-type channel) at the upper end of the project. While some of this sediment may be attributed to natural processes related to the steep slopes and geological conditions of the area, the supply has likely increased over the past 50 years due to the development of the upstream watershed, where there appears to be no stormwater management except for the one storm sewer that discharges directly above the spring. This lack of stormwater management appears to result in increased runoff that

contributes to increasing the size and mobility of the rocks in the deposits and braided channel sections.

As Cove Spring Run makes its way downstream from the spring box, the channel forms a single thread that appears entrenched in the legacy sediment from the historical reservoir. Here, an obvious transition occurs from the coarse sediments to an abundance of fine material and areas of severe bank erosion. The accumulation of these fine sediments has decreased the connection between the floodplain and stream. This condition continues until the confluence with the Holly Branch tributary, which appears to supply additional coarse sediment to the channel. Downstream of Holly Branch, Cove Spring Run maintains a generally steep slope and high entrenchment, flowing over bedrock features and two natural waterfalls, before entering Penitentiary Branch. Downstream of the mouth of Cove Spring Run and the US 127 bridge, Penitentiary Branch has a lower gradient and wider floodplain than Cove Spring Run. No evidence of coarse sediment exists downstream of US 127.

The City of Frankfort, in coordination with the Corps of Engineers, maintains the floodplain above the pump station and levee for storage of flood waters during high flows in the Kentucky River. Our understanding is that beaver populated this reach since at least the 1970's and that they were trapped and removed during this decade to address concerns of flood storage volume and water level upstream of US 127. Before their removal, the beaver dams significantly raised water levels, expanding the floodplain wetlands and forming areas of open water. The eradication of the beaver and their structures drained the wetlands and caused Penitentiary Branch to become incised. Beaver continue to construct dams that are eventually removed by the City.

Bankfull geometry, upon which many morphological parameters are based, was difficult to measure due to the lack of morphological indicators in this entrenched system. Biohabitats observed the most reliable bankfull indicators in the part of the stream reach below the historical dam structure and artificial waterfall. One cross section and longitudinal profile in this reach was surveyed using standard techniques. The cross section was positioned at a riffle that typified the reach based on channel slope and appearance. In addition, a 100-particle Wolman pebble count at the cross section was conducted to characterize bed material and associated channel roughness (Wolman 1954).

The survey information from the cross section was transferred to The Reference Reach Spreadsheet V4.2L (Mecklenburg ODNr 2006) for bankfull discharge estimation by solving the Mannings equation for discharge given the best estimate of bankfull elevation, local channel geometry, slope, and roughness. Channel roughness, represented by Mannings "n," was approximated using the standard references Chow (1959) and Cowan (1956) based on field observations of bed material, channel geometry, and adjacent riparian vegetation. Other geomorphologic conditions were used to classify the channel according to the system outlined in Rosgen (1994). According to the Rosgen system, this section of stream is classified as a B4 channel, which is typically moderately entrenched with a high width/depth ratio and moderate sinuosity. The substrate is coarse gravel which appears to add stability to the cross section. For other stream reaches, land survey data collected by the project team was used to develop existing condition cross sections.

During the geomorphic assessment, four measurements were made of discharge in the stream, based on bankfull indicators and top of bank in the active channel. Bankfull indicators were found on the left and right bank of the surveyed cross section. An average bankfull elevation was also projected from bankfull indicators throughout the longitudinal profile survey. The top of

bank was also surveyed for the cross section. These points yielded an indication of the naturally-forming, stable channel in the valley. The left and average bankfull indicators were between 98 and 110 cfs, which corresponds closely with the 1-year discharge estimates described under the Hydrology section. Biohabitats chose 110 cfs as the restoration design discharge for the reach.

In addition to the geomorphic assessment and bankfull discharge determination, two sites were chosen to observe sediment movement during certain rain events. One site was located upstream of the spring box within the stream channel and another within the historic reservoir footprint approximately 60 feet downstream of the confluence with the Holly Branch. A random sample of rock sizes were measured and placed across the flow path of the stream. After storm events, the movement of the rocks from the site of original placement has been noted along with the rock's size.

Hydrology

As part of the assessment phase, Biohabitats completed an existing conditions hydrologic analysis. This analysis helped us determine design discharge and gain a better understanding of the watershed. It was based on a combination of available Kentucky GIS and geology data, discharge regression equations, winTR-20 modeling, and field survey data. Numerous sinkholes and karst topography, as well as urban development, influence runoff in the area and make it very difficult to predict. As described previously, the hydrologic results were used along with field-collected bankfull measurements to help determine design discharge. Similar relationships between regression analysis, winTR-20 results, and the design discharge for the entire project reach were discovered.

Hydraulics

Biohabitats also completed an existing conditions hydraulic model for the project area. The one-dimensional hydraulic modeling program HEC-RAS (steady flow) was used to estimate velocity, shear stress, and the water surface profiles. The recurrence interval discharge estimates from hydrologic analysis and design discharge decisions were used as flow profiles in the steady flow data. The results of the hydraulic modeling helped guide the restoration design.

Riparian Vegetation

The Cove Spring area primarily includes mesic and calcareous forest species in addition to plant species commonly found in disturbed areas (e.g. open/park land). The project area can largely serve as a reference for the vegetative communities that should be mimicked when choosing species to plant in restoration areas.

The portion of the project area extending from Cove Spring downstream to the first culvert consists of an American sycamore/boxelder maple canopy with a few other species mixed in (e.g., silver maple [*Acer saccharinum*]). The understory consists of younger boxelder/maples and the shrub layer is comprised mainly of spicebush (*Lindera benzoin*). The herbaceous layer consists largely of garlic mustard, although species such as wood nettle (*Laportea canadensis*), white snakeroot (*Ageratina altissima*), and wingstem (*Verbesina alternifolia*) are also prominent.

On the hillsides adjacent to this bottomland, species such as chinkapin oak (*Quercus muhlenbergii*), swamp chestnut oak (*Quercus michauxii*), hackberry (*Celtis occidentalis*), and sugar maple (*Acer saccharum*) are present in the canopy. The understory is made up of

younger cohorts of these trees, and the shrub layer includes such species as spicebush and bladdernut (*Staphylea trifolia*). The hillsides are home to a variety of shade-tolerant herbaceous species.

Downstream towards US 127, the riparian corridor in the area of the proposed bankfull channel is primarily composed of more shade-intolerant species than those found in the upstream bottomland cove. Here, the community on the left bank (facing downstream) is composed of a Kentucky coffeetree (*Gymnocladus dioica*), boxelder, and black locust (*Robinia pseudoacacia*) canopy with redbud (*Cercis canadensis*) and saplings of canopy species in the understory. The shrub layer consists primarily of bush honeysuckle accompanied by Japanese honeysuckle (*Lonicera japonica*). The herbaceous layer includes Japanese honeysuckle, tall fescue (*Festuca arundinacea*), white snakeroot, and various sun-tolerant species. The right bank is largely similar to the hillside community described for the upper portion of the project area but it includes a significant amount of bush honeysuckle in the shrub layer.

The area of Cove Spring located downstream of highway 127 was historically an agricultural field with a channelized stream draining it. Beavers eventually created a series of ponds in this area by damming the stream, and an extensive wetland complex developed. After removal of the beaver dams, the floodplain has become overgrown with large monocultures of poison hemlock (*Conium maculatum*), boxelder, and American Sycamore. In addition, some of the same exotic species (e.g. bush honeysuckle and garlic mustard) that are a problem upstream of Highway 127 are also present in this downstream section.

Several invasive exotic species occur within the riparian corridor and adjacent lands at Cove Spring. If control measures are not taken, these species will invade any plantings that are placed within the restored riparian corridor. The major exotic species within the upper portion of the project area is garlic mustard, while bush honeysuckle seems to occur more in the middle and lower portions of the project area. Japanese honeysuckle inhabits most of the forest edge, while tall fescue grows throughout most open areas. Wintercreeper (*Euonymus fortunei*) and Chinese privet (*Ligustrum sinense*) are also present on the site. Various species that are not native to the project area (such as osage orange [*Maclura pomifera*]) also occur on the site, but most are not generally considered to be highly invasive.

3. Jurisdictional Waters Determination (JWD)

3.1 Wetlands

Wetlands were classified into two groups according to Cowardin et al. (1979): palustrine emergent (PEM) and palustrine scrub-shrub (PSS). Characteristic features of vegetation, soils, and hydrology for each wetland are described in this section and were recorded using Routine Wetland Determination Forms (Attachment 6). Ten PEM wetlands (W-01 – W-09 and W-11) and one PSS wetland (W-10) were observed and delineated within Cove Spring Park.

Ten palustrine emergent wetlands totaling 3.81 acres were delineated (Table 4, Figures 3a and 3b). Two of the 11 PEM/SS wetlands are persistent, emergent, and permanently flooded (PEM1H) fringe wetlands associated with open water areas. The remaining eight are persistent, emergent, and seasonally flooded/saturated (PEM1E). One 2.72-acre wetland was delineated, and classified as a palustrine, scrub-shrub, seasonally flooded/saturated wetland (PSS1E).

Table 4. Wetland areas delineated at Cove Spring Park with a determination of their connection to waters of the U.S.

Jurisdictional Feature	Cowardin Classification	Size (ac)	Connection
W-01	PEM1E	1.78	Connected
W-02	PEM1H	0.05	Connected
W-03	PEM1E	0.91	Connected
W-04	PEM1E	0.06	Connected
W-05	PEM1E	0.11	Connected
W-06	PEM1E	0.10	Connected
W-07	PEM1H	0.08	Connected
W-08	PEM1E	0.27	Connected
W-09	PEM1E	0.16	Connected
W-10	PSS1E	2.72	Connected
W-11	PEM1E	0.29	Connected
Total		6.53	
Isolated Waters		0.00	
Jurisdictional Waters		6.53	

One questionable wetland area was determined to be an atypical situation caused by man-made conditions. According to the methods described in section (D) of the USACE Wetland Delineation Manual (Environmental Laboratory 1987) it was determined that normal circumstances did not exist in this area. Under subsection (4), man-induced wetlands are defined as an area that has developed at least some characteristics of naturally occurring wetlands due to either intentional or incidental human activities (Environmental Laboratory 1987). This area displayed wetland hydrology and hydrophytic vegetation. However, hydric soils were not observed because the bottom of this area was constructed with concrete, making it a man-induced wetland. The USACE Wetland Delineation Manual (Environmental Laboratory 1987) states that all three wetland indicators (soils, vegetation, and hydrology) may be found in some man-induced wetlands, although indicators of hydric soils are usually absent. Step 4 under subsection 4 (man-induced wetlands) states that if hydrophytic vegetation is being maintained only because of man-induced wetland hydrology that would no longer exist if the activity were to be terminated, the area should not be considered a wetland (Environmental Laboratory 1987). Based on the above information, this area is not a jurisdictional wetland (see Attachment 4, non wetland 2; Attachment 6, non wetland 2 data form).

Routine Wetland Determination Forms were completed for these areas and are included in Attachment 6. Photographs of wetland areas are included in Attachment 4.

3.2 Open Water

All open water areas were classified as palustrine unconsolidated bottom, mud, permanently flooded (PUB3H). Two PUB3H areas totaling 0.26 acre were delineated (Table 2, Figures 3a and 3b). Photographs of both PUB3H areas are included in Attachment 3.

Table 5. Open water areas delineated at Cove Spring Park with a determination of their connection to waters of the U.S.

Jurisdictional Feature	Cowardin Classification	Size (ac)	Connection
OW-1	PUB3H	0.09	Connected
OW-2	PUB3H	0.17	Connected
Total		0.26	

3.3 Streams

Streams within Cove Spring Park were classified into three groups: perennial, intermittent, and ephemeral (Figures 3a and 3b). Stream habitat evaluations were conducted using the U.S. Environmental Protection Agency's *Rapid Bioassessment Protocols* (RBP) format (Barbour et al 1999) (see Section 6.4).

A summary of flow regime and length for every intermittent and perennial stream at Cove Spring Park can be found in Table 3. Stream lengths reported in Table 3 are preliminary and approximate; therefore, the detailed survey-derived data reported in Section 6.4 and the Conceptual Restoration Plan should be relied upon for calculation of impacts. Photographs of each stream sample reach are included in Attachment 4.

Table 6. Streams identified within the Cove Spring Park boundary.

Sample Reach	Flow Regime	Stream Length (Linear Ft)
S-01	Ephemeral	513
	Intermittent	2,427
	Perennial	1,497
S-02	Ephemeral	116
S-03	Ephemeral	119
S-04	Ephemeral	205
S-05	Ephemeral	72
S-06	Intermittent	1,255
	Perennial	515
S-07	Ephemeral	114
S-08	Perennial	135
S-09	Ephemeral	564
	Intermittent	827
S-10	Ephemeral	159
S-11	Ephemeral	66
S-12	Ephemeral	35
S-13	Ephemeral	173
S-14	Ephemeral	876
S-15	Ephemeral	91
S-16	Ephemeral	1,291
	Intermittent	399
S-17	Ephemeral	337
S-18	Ephemeral	104
S-19	Ephemeral	352
S-20	Ephemeral	82
S-21	Perennial	175
S-22	Ephemeral	181
S-23	Ephemeral	254
	Intermittent	68
S-24	Perennial	606
S-25	Perennial	3,740
S-26	Perennial	661
S-27	Ephemeral	486
Total Ephemeral		6,190
Total Intermittent		4,976

Sample Reach	Flow Regime	Stream Length (Linear Ft)
	Total Perennial	7,329

4. Threatened/Endangered Species and Critical Habitat

Formal request for federally listed species occurrence was initiated with the U.S. Fish and Wildlife, Kentucky Field Office. Written response was received on December 19, 2007 (Attachment 7). In this communication, the following species were listed as having the potential to occur on the Cove Spring property:

Table 7. Federally Listed Species reported by USFWS as having the potential to occur in the project area.

Species	Common Name	Status	Habitat Present
Mammal			
<i>Myotis sodalis</i>	Indiana bat	E	Yes
<i>Myotis grisescens</i>	Gray bat	E	Foraging, Marginal Cave
Plant			
<i>Trifolium stoloniferum</i>	Running buffalo clover	E	Marginal
<i>Arabis perstellata</i>	Braun's rock cress	E	Yes
<i>Lesquerella globosa</i>	Globe bladderpod	C	Yes

4.1 *Indiana bat*

In the summer, Indiana bats utilize a wide array of forested habitats, including riparian forests, bottomlands, and uplands for both foraging and roosting habitat. Indiana bats typically roost under exfoliating bark, in cavities of dead and live trees, and in snags. Trees in excess of 16 inches in diameter are considered optimal for maternity colony roosts, but roosts have been documented in trees as small as 3 inches diameter. In winter, Indiana bats congregate in caves and abandoned mines to hibernate. No critical habitat has been designated for this species in Franklin County (USFWS 2008).

Within the boundaries of the project, there is roosting habitat. Individual trees are present that are of sufficient size and condition that they may foster Indiana bat roosting individuals or colonies. As part of restoration activities within the Cove Spring restoration area, very few trees will be removed – only when stream bank stabilization warrants re-grading. Those that do require removal will be cleared during the allowable period between October 15 and March 31, as conditioned in the Coordination Letter received from U.S. Fish and Wildlife Service (Attachment 7). If potential roost trees cannot be removed during this period then further guidance will be sought by USFWS. Activities such as emergence counts and or direct surveys may be performed.

As suggested by the USFWS, all caves, rock shelters, and/or abandoned mines will be avoided. At least one cave is located near the Cove Spring Park property; however, it has been extensively altered through historic and current human use. City of Frankfort water lines currently pass through the cave which has significantly altered the cave ecology. Therefore, it is unlikely that this cave houses an Indiana Bat hibernaculum. Due to the degraded nature of the

cave and its lack of close proximity to restoration activities no mitigation measures are proposed.

4.2 Gray bat

Gray bats roost, breed, rear young, and hibernate in caves year round. They migrate between summer and winter caves and will use transient or stopover caves along the way. Gray bats forage along medium sized creeks and rivers to large lakes up to 12 miles from their roost locations. No critical habitat has been designated for this species in Kentucky (USFWS 2008).

As suggested by the USFWS, all caves, rock shelters, and/or abandoned mines will be avoided (see Attachment 7). At least one cave is located near the Cove Spring Park property; however, it has been extensively altered through historic and current human use. City of Frankfort water lines currently pass through the cave, which has significantly altered the cave's ecology. Male gray bats have been caught in the vicinity of this cave by ETC ecologists. Caves similar to this one are used by male gray bats as day roosts or temporary night roosts, but it is unlikely that this cave houses a maternity colony or hibernaculum. Due to the degraded nature of the cave and its lack of close proximity to restoration activities no mitigation measures are proposed.

Stream foraging may be affected temporarily with the removal and redistribution of instream habitat necessary for the development of insect prey items. However, stream restoration activities are proposed herein, and are expected to increase the quality of available habitat for invertebrates and other fauna.

4.3 Running buffalo clover

Running buffalo clover habitat consists of old trails, traces, and roads; grazed bottomlands, stream banks, lawns, shoals, and cemeteries with native vegetation, prairies, well-drained and mesic soils, and filtered to partial light. This species needs an intermediate amount of disturbance, such as light grazing, to exist. Flowering period is early April to mid-summer. Records of this plant are known from Franklin County. No critical habitat is designated has been designated for this species in Kentucky (USFWS 2008).

Marginal potential habitat for running buffalo clover exists along the margins of clearings and streambanks within the project area. However, the majority of unforested areas within the project area are intensively manicured and it is unlikely that running buffalo clover exists on the property. As referenced in the USFWS response letter, a survey of plant species was conducted by Deborah White of the Kentucky State Nature Preserves Commission (KSNPC) in the spring of 2007. No running buffalo clover was found to exist on the property (see Attachment 7).

4.4 Braun's rockcress

Habitat consists of rocky, wooded slopes on blackish clay loams over limestone or acid limestone cobble. Flowering period is early April to late May. Braun's rockcress produces white to lavender cross-shaped flowers in late March-early May. The fruits are long pods, containing reddish- brown, flattened seeds about 1mm long.

The project is not within critical habitat for Braun's rockcress designated by the USFWS (Federal Register June 2004 [69 FR 31460-31496]). There are 14 areas of critical habitat designated in Franklin County, but the closest areas (Units 9 and 17) are at least 1.5 miles away from the project area.

A survey of plant species was conducted by Deborah White of the KSNPC in the spring of 2007. Braun's rock cress was found to occupy rocky slopes adjacent to the proposed stream restoration area. Since the proposed stream restoration work will not impact the wooded hillside where this species occurs, it was the opinion of the USFWS that this project will not likely adversely affect this species (see Attachment 7).

4.5 *Globe bladderpod*

Habitat consists of calcareous rocks and barrens, wooded cliff edges. Flowers are bright yellow to yellow-orange, cross-shaped, each having 4 petals about 5 mm long. Fruit is a nearly globe-shaped capsule, about 3 mm in diameter, with 1 or 2 seeds in each cell.

Potential habitat for globe bladderpod exists along rocky slopes within the project area. However, a survey of plant species was conducted by Deborah White of the (KSNPC) in the spring of 2007. No globe bladderpod was found to exist on the property (see Attachment 7).

5. Historic and Cultural Resources

Consultation with the Kentucky Archaeological Society (KAS) was conducted in order to determine whether or not elements of archaeological significance exist on the Cove Springs site (Attachment 8). The KAS provided reports concerning structural remains of the City of Frankfort Waterworks, the Cove Springs Farmstead, and a stone fence on Cove Spring Park's western boundary. Structural remains of the waterworks are potentially eligible for listing in the National Register of Historic Places. The KAS indicated that a site visit by an archaeologist is not necessary to assess the project's impact area. All historically important structures listed by KAS have been avoided during design of this stream restoration.

6. Compensatory Mitigation Plan

6.1 *Site Selection*

A plan was developed including stream restoration and enhancement along 7,203 linear feet of stream. These reaches were selected because they have potential to improve water quality in historically disturbed stream ecosystem suffering from channel instability. The project should result in increased filtration of stormwater runoff. In addition, the project area is in a public park, where visibility of the restoration has potential to foster an awareness of the importance of watershed health and proper management.

Several key items drove the restoration approach for this project:

- Lack of stormwater management in the upper watershed.
- High supply of cobble-sized limestone rocks from valley walls.
- Legacy sediment accumulation in the Cove Spring Run floodplain due to the historical dam.
- Natural fish barriers formed by bedrock in upstream half of Cove Run.
- Park setting along Cove Spring Run.
- Historical spring box, dam, and reservoir structures.
- Legacy sediment accumulation in the Penitentiary Branch floodplain due to backwater from the Kentucky River, the Jones Run levee, and past beaver dams.
- Flood storage function of floodplain above Jones Fall pump station.

- Persistent presence of beaver in Penitentiary Branch.
- Loss of wetland habitat in floodplain of Penitentiary Branch.

6.2 Site Protection Instrument

The protective covenant, in the form of a conservation easement will be put in place on sections of Cove Spring Run, Holly Branch, and Penitentiary Branch within Cove Spring Park. In order to accommodate existing land uses and park infrastructure, the boundary of this easement is variable along the length of the project area. A detailed description of the easement boundaries is given in Attachment 9. Conservation easements have been signed by the city of Frankfort, HG Mays, and an agreement has been reached between KDFWR and KYTC. All easements will be filed at the Franklin County Courthouse prior to construction.

6.3 Baseline/Proposed Design Information

The restoration approach for Cove Spring Run and Penitentiary Branch combines stormwater management with wetland and stream restoration. In the upper-most reach of Cove Run and in the reach downstream of Route 127, we propose a series of broad and shallow riffle/weir structures constructed between large stream pools that reconnect the stream to the floodplain. This restoration method has been used at other sites to promote wetland development, safely convey stormwater, provide dynamic and diverse ecosystems, enhance pollutant uptake and assimilation, improve stream baseflow, and provide a natural aesthetic to sites. It helps address a number of the design items listed previously.

This approach is also less vulnerable to damage from beaver activities compared to a single-thread bankfull channel design. Typically, much effort goes into the precise location, design, and construction of a proposed bankfull stream and associated structures, all of which could be quickly wiped out by a beaver dam. Our riffle/weir floodplain reconnection approach significantly lessens the potential for beaver dams to cause failure of the channel and associated structures. It recognizes that the net ecological effect of the beaver is positive and works with, not against, their presence. In the other parts of the project, we propose a step/pool stream system.

Numerous steps and cascades will be constructed to stabilize the channel and provide habitat for aquatic life. Cascade rocks below each step and pools between each step will help dissipate energy and offer a refuge for organisms. Step pool sequences will allow sediment to move downstream, thus preventing the generation of mid channel bars and potential bank erosion. Bioengineering such as live branch layering may be installed along the toe of the bank between steps to help stabilize the currently eroding banks. Within the historical reservoir, we propose raising the channel invert to facilitate grading the banks to a stable angle and establishing native riparian vegetation. A well vegetated buffer will provide habitat in the form of root wads and root mats and shade the stream from the warming sunlight.

Data Validation

Baseline data collection for the Cove Spring restoration reaches was conducted during several site visits in 2008. Comprehensive reporting of the raw data is located in Attachments 5 and 6. Parameters integral to the design of restoration reaches is presented in Tables 8-11. In general, Biohabitats observed unstable stream morphology due largely to development of the upper watershed with insufficient stormwater management. In addition, bank erosion is a

significant issue, especially in the fine sediment left behind within the historical reservoir, and channel incision prevents floodplain interaction in several parts of the project area.

Proposed characteristics of stream reaches after stream restoration are provided in tables 9 and 10. Proposed characteristics are not provided in tables 8 and 11 because stream restoration activities in those sections will consist primarily of pool/weir complexes which are not conducive to typical stream characterization.

Table 8. Existing conditions at the upper portion of Cove Spring Run.

Parameter	Existing
Drainage Area (miles ²)	0.2
Rosgen Stream Type (Level II)	G3
Bankfull Discharge Flow (Q _{bkf}) (cfs)	70
t _{cr} *	na
t _{cr}	4.87
Channel slope (ft/ft)	0.014
Valley slope (ft/ft)	0.015
Sinuosity	1.1
Average Depth (ft)	3.7
Max. Depth (ft)	5.9
Channel Width (ft)	32.8
Channel Area (ft ²)	123
Width:Depth Ratio	8.7
Wetted Perimeter (ft)	37
Hydraulic Radius	3.3

na = not applicable

Table 9. Existing and proposed conditions for the lower portion of Cove Spring Run.

Parameter	Existing/Reference	Proposed
Drainage Area (miles ²)	0.5	0.5
Rosgen Stream Type (Level II)	G5/B31	B3/1
Bankfull Discharge Flow (Q _{bkf}) (cfs)	70-120	70-120
t _{cr} *	na	na
t _{cr}	0.98	1-1.7
Channel slope (ft/ft)	0.024	.0146-.027
Valley slope (ft/ft)	0.03	0.03
Sinuosity	1.4	1.3
Ave. Riffle Depth (@ BKF) (ft)	0.7	1.1-1.3
Max. Riffle Depth (@ BKF) (ft)	1.5	1.5-1.8
Ave. Pool Depth (@ BKF) (ft)	na	2-2.1
Max. Pool Depth (@ BKF) (ft)	na	3-3.6
Belt Width (ft)	na	na
Radius of Curvature (ft)	na	na
Meander Wavelength (ft)	na	na
Floodprone Width (ft)	37	27-100
Bankfull Width (ft)	23.5	18-19

Parameter	Existing/Reference	Proposed
Bankfull Area (ft ²)	16.2	18.4-19.7
Entrenchment Ratio	1-1.6	1.4-5.3
Width:Depth Ratio	34.1	15-17
Wetted Perimeter (ft)	24.2	18.4-19.5
Hydraulic Radius	0.7	1.1-1.2

na = not applicable

Table 10. Existing and proposed conditions for the lower portion of Holly Branch.

Parameter	Existing/Reference	Proposed
Drainage Area (miles ²)	0.5	0.5
Rosgen Stream Type (Level II) ¹	G5/B31	B3
Bankfull Discharge Flow (Q _{bkf}) (cfs)	50	50
t _{cr} ⁴	na	na
t _{cr}	3.8	2
Channel slope (ft/ft)	0.038	0.037
Valley slope (ft/ft)	0.05	0.05
Sinuosity	1.07	1.02
Ave. Riffle Depth (@ BKF) (ft)	na	0.7
Max. Riffle Depth (@ BKF) (ft)	na	1
Ave. Pool Depth (@ BKF) (ft)	na	1.6
Max. Pool Depth (@ BKF) (ft)	na	2.5
Belt Width (ft)	na	na
Radius of Curvature (ft)	na	na
Meander Wavelength (ft)	na	na
Floodprone Width (ft)	na	28-30
Bankfull Width (ft)	na	15
Bankfull Area (ft ²)	na	9.8
Entrenchment Ratio (bankfull)	na	1.9-2
Width:Depth Ratio (bankfull)	na	23
Wetted Perimeter (ft) (bankfull)	na	15.2
Hydraulic Radius (bankfull)	na	0.64
Average Depth (ft) (channel)	2.9	na
Max. Depth (ft) (channel)	4	na
Channel Width (ft)	20.6	na
Channel Area (ft ²)	71.9	na
Width:Depth Ratio (channel)	12.3	na
Wetted Perimeter (ft) (channel)	21.6	na
Hydraulic Radius (channel)	1.6	na

na = not applicable

Table 11. Existing conditions at the lower portion of Penitentiary Branch.

Parameter	Existing
Drainage Area (miles ²)	3.4
Rosgen Stream Type (Level II)	E5
Bankfull Discharge Flow (Q _{bkf}) (cfs)	70+
t _{cr} *	na
t _{cr}	1.1
Channel slope (ft/ft)	0.0028
Valley slope (ft/ft)	0.004
Sinuosity	1.1
Average Depth (ft)	1.7
Max. Depth (ft)	2.4
Channel Width (ft)	20.6
Channel Area (ft ²)	34.6
Width:Depth Ratio	12.3
Wetted Perimeter (ft)	21.6
Hydraulic Radius	1.6

na = not applicable

Rapid Bioassessment Protocol (RBP) stream data sheets from the Kentucky Division of Water's (KDOW) manual *Standard Methods for Assessing Biological Integrity of Surface waters in Kentucky* were completed on all restoration reaches (KDOW 2008). High gradient stream forms were completed on portions of the project area upstream of US127 and low gradient stream forms were completed on downstream portions. Existing scores ranged from 95 to 145 in the upstream portion and 99 to 118 in the downstream portion (see Section 6.4, Table 12). According to KDOW (2008) these scores indicate that stream habitat is poor to average in the upstream sections and poor in the downstream section. Factors contributing to these low ratings vary by sample reach; therefore, the scores for individual habitat parameters are provided in Tables 13 and 14.

6.4 Determination of Credits

Stream Credit

In order to determine the amount of stream restoration credit to be obtained by this project, existing stream habitat scores were compared to estimates of post-restoration habitat scores. RBP forms were used to characterize existing and proposed stream habitat along nine reaches in the project area (Figure 4, Tables 12-14). On average, two segments (Cove Spring Run-Lower and Holly Branch) will be elevated from a poor stream habitat rating to an average rating, while the remaining two segments (Cove Spring Run-Upper and Penitentiary Branch) will be elevated from a poor rating to an excellent rating. Individual habitat parameters which will be improved by this project are detailed in Tables 12 and 13. Although specific habitat improvements will vary by reach, some of the most improved factors will include bank stability, vegetative protection, and pool variability.

Table 12. Scores (on a scale of 0-20) for individual habitat parameters at each reach upstream of US127.

High Gradient RBP Scores		Cove Spring Upper						Cove Spring Lower						Holly Br.	
		Reach 1		Reach 2		Reach 3		Reach 1		Reach 2		Reach 3		Reach1	
		Ex	Pro	Ex	Pro	Ex	Pro	Ex	Pro	Ex	Pro	Ex	Pro	Ex	Pro
1	Epifaunal Substrate	12	16	8	17	11	17	15	17	6	6	12	12	10	14
2	Embeddedness	13	13	9	13	15	17	14	17	5	5	14	14	13	15
3	Velocity/Depth Regime	13	18	13	18	13	17	15	17	5	5	15	15	13	15
4	Sediment Deposition	9	12	7	12	10	16	14	17	5	5	13	13	12	15
5	Channel Flow Status	9	15	13	15	9	15	13	15	16	16	12	12	12	15
6	Channel Alteration	13	13	10	10	9	11	13	13	12	12	11	11	14	14
7	Frequency of Riffles	17	17	10	17	16	16	18	18	7	7	15	15	17	17
8	Bank Stability	13	18	15	18	8	16	15	18	15	18	16	18	4	14
9	Vegetative Protection	18	18	12	18	8	16	17	18	13	18	15	18	12	16
10	Riparian Vegetative Zone Width	17	18	17	18	12	16	11	14	11	14	12	18	16	16
TOTAL		134	158	114	156	111	157	145	164	95	106	135	146	123	151

Ex - existing, Pro - proposed

Table 13. Scores (on a scale of 0-20) for individual habitat parameters at each reach downstream of US127.

Low Gradient RBP Scores		Penitentiary Branch			
		Reach 1		Reach 2	
		Ex	Pro	Ex	Pro
1	Epifaunal Substrate	10	17	13	18
2	Pool Substrate Characterization	8	17	17	18
3	Pool Variability	10	18	5	18
4	Sediment Deposition	11	13	13	10
5	Channel Flow Status	16	19	10	18
6	Channel Alteration	11	11	15	15
7	Channel Sinuosity	5	5	7	7
8	Bank Stability	8	18	12	18
9	Vegetative Protection	10	18	12	18
10	Riparian Vegetative Zone Width	10	18	14	18
TOTAL		99	154	118	158

Ex - existing, Pro - proposed

Table 14. Summary of existing and proposed RBP scores.

Stream Segment	Existing		Proposed	
	Length	RBP Score	Length	RBP Score
Cove Spring Run Upper				
AS1	800	134	747	158
AS2	250	114	207	156
AS3	1,227	111	1,164	157
Mean RBP		119		157
Total Length		2,277		2,118
Cove Spring Run Lower				
AS4	620	145	615	164
AS5	318	95	318	106
AS6	200	135	190	146
Mean RBP		129		145
Total Length		1,138		1,123
Holly Branch				
AS7	193	123	228	151
Mean RBP		123		151
Total Length		193		228
Penitentiary Branch*				
AS8	2,700	99	2,700	154
AS9	895	118	832	158
Mean RBP		104		155
Total Length		3,595		3,532

*low gradient form used

The mitigation ratio for streams in central Kentucky varies by flow status (ephemeral, intermittent, perennial), stream habitat quality, and width of the riparian protection area. Because the project will include stream reaches with various characteristics the proposed mitigation credit ratio varies from 0.85 to 1.5. Overall, a gain of 9,236 mitigation units is expected from this restoration project. Therefore, stream habitat and stability improvements are anticipated to approximately double the Adjusted Mitigation Units (AMUs) present at the site. Proposed mitigation credit for each stream segment is detailed in Table 15.

Table 15. Mitigation credit to be obtained through the completion of the Cove Spring Stream Restoration Project.

					TOTAL
Stream Information					
Stream Name	Cove Spring (upper)	Cove Spring (lower)	Holly Branch	Penitentiary Branch	
Stream Type	Intermittent	Perennial	Intermittent	Perennial	
Existing					
Initial RBP Score	119	129	123	104	
Initial Quality Rating	Poor	Poor	Poor	Poor	
Quality Ratio	1.00	1.50	1.00	1.50	
Length	2,277	1,138	193	3,595	7,203
Existing Mitigation Units	2,277	1,707	193	5,393	9,570
Proposed					
Predicted RBP Score	157	145	151	155	
Predicted Quality Rating	Excellent	Average	Average	Excellent	
Quality Ratio	2.00	2.25	1.50	3.00	
Mitigation Ratio	0.85	0.85	1.00	1.20	
Proposed Length	2,118	1,123	228	3,532	7,001
Proposed Mitigation Units	3,601	2,148	342	12,715	18,806
Mitigation Units Credit/Debit	1,324	441	149	7,323	9,236

Wetland Credit

Wetlands W-06 and W-09 will be impacted by earthwork and/or structure installation associated with stream restoration activities. However, the project will be a net-gain for wetland acreage within the project area (Table 16). Newly created wetland habitat will result from raising the water table in the lower half of the project area. Approximately 6.79 acres of wetland and open water currently exist within the project boundary (See Section 3 and Attachment 3).

The amount of wetland acreage that will be produced by restoration activities was estimated based on post-restoration water table elevations. Water table elevation projections were based on the estimated post-restoration permanent water surface, soil bulk density, soil porosity, detailed elevation contour mapping, current water table elevation and field surveys. Restoration activities will result in the addition of approximately 3.65 acres of palustrine emergent wetland and 10.98 acres of palustrine forested wetland. This will be a net-gain of 3.39 acres of emergent wetland and 10.98 acres of forested wetland within the project area (Figures 5 and 6).

Table 16. Estimated wetland loss and gain as a result of the Cove Spring Stream Restoration Project.

Jurisdictional Waters Type	Existing	Impacted	Proposed	Net Gain
PEM Wetland	3.81	0.26*	3.65	3.39
PSS Wetland	2.72	0	0	0
PFO Wetland	0	0	10.98	10.98
Open Water	0.26	0	3.31	3.31

*W-06 and W-09 will be impacted by stream restoration activities.

6.5 Mitigation Work Plan

Proposed In-stream Restoration Activities

The conceptual mitigation plan outlining instream restoration activities is located in its entirety in The Conceptual Stream Restoration Plan. It consists of the following components:

- A series of broad and shallow riffle/weir structures constructed between large stream pools that reconnect the stream to the floodplain
- Step pool sequences which allow sediment to move downstream, thus preventing the generation of mid channel bars and potential bank erosion
- Bioengineering such as live branch layering which may be installed along the toe of the bank between steps to help stabilize the currently eroding banks
- Raising of the channel invert within the historical reservoir to facilitate grading the banks to a stable angle and establishment of native riparian vegetation

The contractor will meet with the project engineer, construction supervisor, and appropriate agency personnel prior to construction to review erosion and sediment control requirements, sequence of construction, limits of disturbance, channel layout, and tree impact. The contractor will ensure that all restoration equipment and activities remain within the limits of disturbance at all times. Dewatering of the channel will only occur along the length of channel which can be completed in one day. In addition, clearing and grubbing will only occur in the areas where channel grading is being conducted. Areas where grading is finished will be permanently stabilized with vegetation when completed, and unfinished areas will be temporarily stabilized before leaving for the day such that the channel is stabilized during rain events. No work is to be conducted during rain events, and proper erosion/sedimentation control devices must be in place to prevent contribution of sediment laden water to the stream channel (see also sheet 57 of the Conceptual Stream Restoration Plan).

Proposed Riparian Enhancement

Riparian planting zones are included in the plan to enhance existing riparian vegetation and to establish native riparian vegetation in areas where it does not currently exist. The riparian vegetation will provide habitat for wildlife along the stream corridor and will improve aquatic habitat by providing shade to cool the stream and detritus to support the macroinvertebrate community. The riparian vegetation will also help stabilize stream banks within the reach.

Currently, the Cove Spring area includes mesic and calcareous forest species in addition to plant species commonly found in disturbed areas (e.g. open/park land). The project area can

largely serve as a reference for the vegetative communities that should be mimicked when choosing species to plant in restoration areas. However, in areas that consist of monocultures of native plants and/or exotic species it is the purpose of this project to establish diverse, native communities of plants. Many species, such as boxelder maple (*Acer negundo*) and American sycamore (*Platanus occidentalis*) will most likely grow well as volunteers without much additional planting. Native herbaceous and shrub species may also serve as an excellent source of seed for restoration efforts. There are several exotic invasive species, such as garlic mustard (*Alliaria petiolata*) and bush honeysuckle (*Lonicera mackii*), which will volunteer in restoration plantings if not eradicated.

The project area was divided into fourteen planting zones. These areas differ in terms of hydrology, sunlight, anticipated soil disturbance by this project, and/or public use. Mapping of the planting zones, along with detailed information on planting methods, can be found in sheets 46-56 of the Conceptual Stream Restoration Plan. In general, plantings directly adjacent to the stream will consist of flow-tolerant herbaceous and shrub species. Immediately upslope there will be a zone of floodplain forest trees, shrubs, and herbaceous species. Upslope from there, plantings will consist mostly of mesic forest species. Within the limits of disturbance of the proposed project, woody species will be planted at a rate greater than 300 stems per acre. In some areas that will not be disturbed supplemental plantings will be added in order to increase the diversity and density of native woody vegetation. In certain areas, low densities of more mature trees and shrubs will be planted in order to maintain the aesthetic value of the park and avoid trampling by visitors. In addition, there are several zones where revegetation has been designed to accommodate park infrastructure and incorporate specialized displays of native plants (Tables 16 and 17).

Table 17. Tree and shrub species to be used in each planting zone at the Cove Spring Stream Restoration Project.

		Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	Zone 12	Zone 13	Zone 14
Trees															
<i>Acer rubrum</i>	Red maple													X	X
<i>Acer saccharinum</i>	Silver maple		X						X					X	X
<i>Betula nigra</i>	River birch		X						X					X	X
<i>Carpinus caroliniana</i>	Ironwood		X						X						
<i>Carya laciniosa</i>	Shellbark hickory			X	X					X					
<i>Carya ovata</i>	Shagbark hickory			X	X	X		X		X					
<i>Cercis canadensis</i>	Redbud					X									
<i>Diospyros virginiana</i>	Persimmon			X	X			X		X					
<i>Fraxinus pennsylvanica</i>	Green ash		X						X					X	X
<i>Fraxinus quadrangulata</i>	Blue ash							X							
<i>Gymnocladus dioica</i>	Kentucky coffeetree					X									
<i>Juglans nigra</i>	Black walnut							X							
<i>Liquidambar styraciflua</i>	Sweetgum													X	X
<i>Nyssa sylvatica</i>	Black gum			X	X					X				X	X
<i>Populus deltoides</i>	Eastern cottonwood													X	X
<i>Quercus bicolor</i>	Swamp white oak													X	X
<i>Quercus macrocarpa</i>	Bur oak							X							
<i>Quercus michauxii</i>	Swamp chestnut oak			X	X					X				X	X
<i>Quercus palustris</i>	Pin oak		X	X	X	X			X	X				X	X
<i>Quercus prinus</i>	Chestnut oak					X									
<i>Quercus rubrum</i>	Northern red oak			X	X	X				X					
<i>Quercus shumardii</i>	Shumard oak					X									
<i>Salix nigra</i>	Black willow	X											X		
<i>Ulmus rubra</i>	Slippery elm		X	X	X				X	X				X	X
Shrubs															
<i>Alnus serrulata</i>	Smooth alder	X	X						X			X			
<i>Cephalanthus occidentalis</i>	Buttonbush	X	X	X	X				X			X	X	X	X
<i>Cornus amomum</i>	Silky dogwood	X	X						X			X	X	X	X
<i>Cornus florida</i>	Flowering dogwood			X	X	X									
<i>Cornus racemosa</i>	Grey dogwood			X	X	X									
<i>Corylus americana</i>	Hazlenut		X						X			X			
<i>Hamamelis virginiana</i>	Witch hazel		X	X	X				X						
<i>Ilex decidua</i>	Possumhaw													X	X
<i>Ilex verticellata</i>	Common winterberry													X	X
<i>Lindera benzoin</i>	Spicebush			X	X									X	X

		Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	Zone 12	Zone 13	Zone 14
<i>Sambucus canadensis</i>	Elderberry		X						X					X	X
<i>Viburnum acerifolium</i>	Mapleleaf viburnum			X	X	X									
<i>Viburnum dentatum</i>	Arrowwood viburnum	X										X	X		

Table 18. Herbaceous species to be used in each planting zone at the Cove Spring Stream Restoration Project.

		Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	Zone 12	Zone 13	Zone 14
<i>Alisma subcordatum</i>	Mud plantain											X	X		
<i>Andropogon gerardii</i>	Big bluestem							X							
<i>Asclepias tuberosa</i>	Butterfly weed							X							
<i>Carex frankii</i>	Frank's sedge	X	X	X					X		X	X	X	X	X
<i>Carex vulpinoidea</i>	Fox sedge	X	X	X					X		X	X	X	X	X
<i>Chelone glabra</i>	Turtlehead	X										X	X		
<i>Echinacea pallida</i>	Pale coneflower							X							
<i>Eleocharis obtusa</i>	Blunt spikerush	X									X	X	X		
<i>Elymus virginicus</i>	Virginia wild rye	X		X					X		X	X		X	X
<i>Festuca</i> sp.	Lawn Mix						X			X					
<i>Glyceria striata</i>	Fowl mannagrass	X	X	X					X		X		X	X	X
	Swamp rose														
<i>Hibiscus moscheutos</i>	mallow	X											X	X	
<i>Iris virginica</i>	Virginia blue flag	X										X	X		
<i>Juncus effusus</i>	Soft rush	X									X	X	X	X	X
<i>Juncus tenuis</i>	Slender pathrush	X	X	X					X		X	X	X	X	X
<i>Leersia oryzoides</i>	Rice cutgrass	X	X	X					X		X		X	X	X
<i>Lobelia cardinalis</i>	Cardinal flower		X	X					X			X	X	X	X
<i>Lobelia siphilitica</i>	Blue lobelia		X	X					X				X	X	X
<i>Mimulus ringens</i>	Monkey flower		X	X					X			X	X		
<i>Monarda fistulosum</i>	Bergamont							X							
<i>Panicum virgatum</i>	Switchgrass							X							
<i>Rudbeckia triloba</i>	Brown-eyed Susan		X	X				X	X						
<i>Sagittaria latifolia</i>	Duck potato											X	X		

		Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	Zone 12	Zone 13	Zone 14
<i>Saururus cernuus</i>	Lizard tail	X													
<i>Schizachyrium scoparium</i>	Little bluestem							X							
<i>Scirpus atrovirens</i>	Dark green bulrush	X									X	X	X	X	X
<i>Scirpus cyperinus</i>	Wool grass	X									X	X	X	X	X
<i>Silphium laciniatum</i>	Compass plant							X							
<i>Sorghastrum nutans</i>	Indian grass							X							
<i>Verbena hastata</i>	Blue vervain	X										X	X	X	X

6.6 Maintenance Plan

Instream Structures and Habitat: All constructed features described in the conceptual plan will be maintained as needed in order to preserve their structural integrity and continued functionality. To minimize future problems with the components of the plan, implementation of the design will be overseen by qualified personnel experienced in the supervision of natural channel design techniques.

Riparian Planting: Plantings may be supplemented as needed in accordance with performance standards should significant mortality occur from wildlife browsing, competition from exotic species, and or other unforeseen stresses.

6.7 Performance Standards

Instream Structures and Habitat: The stable stream conditions for these reaches have been previously identified as a B3 and B3/1 stream type. The range of conditions that define these stream types will comprise the performance standards for geomorphic parameters. In addition, structures such as the weirs and their associated berms must remain stable. During monitoring reporting, parameters must meet the success criteria set forth in Table 19.

If those criteria are not being met, an investigation will ensue to identify the causal factors. In certain cases, watershed influences outside the control of Cove Spring Park, may be the driving force, and no reasonable remedies will be available under the auspices of this regulatory compliance.

Riparian and Wetland Planting: Zones 2, 3, 4, 5, 11, 13 and 14 will have a density of at least 300 stems/acre after the completion of five growing seasons. Zones 1 and 12 will have a density of at least 150 stems/acre, but will include a significant herbaceous wetland component. Zone 8 will have a density of at least 150 stems per acre, but because these plantings will consist of larger trees this zone will have a higher long-term survival rate in close proximity to human activity. Zone 10 will be an herbaceous wetland community consisting of native species. Zones 6, 7 and 9 are manicured plantings and will not be formally monitored. Planting zones that are subject to formal monitoring will meet the success criteria presented in Tables 19 and 20.

Wetland Vegetation, Hydrology and Soils: Wetlands created during stream restoration will be monitored to ensure that they meet wetland hydrology criteria. Groundwater monitoring wells will be installed and checked monthly to determine whether wetland restoration areas are achieving wetland hydrology (inundation or saturation in the upper 12 inches of soil for greater than 10% of the growing season). At the conclusion of the monitoring period, a jurisdictional waters determination will be conducted to identify the acreage within the project area that meets the criteria of vegetation, hydrology and soils that define a wetland according to the 1987 USACE wetland delineation manual (Environmental Laboratory 1987) (see Table 20).

6.8 Monitoring Plan

In accordance with the USACE 2008 Compensatory Mitigation Rule for Losses of Aquatic Resources (33 CFR 325) and KDOW Draft Stream Mitigation Guidelines (2007), annual monitoring will be conducted throughout the proposed Cove Spring Restoration reaches. The monitoring period will continue for a period of five years, beginning with an as-built report in the year in which construction was completed (Year 0) and ending after five full calendar years following construction. Annual monitoring reports will be submitted to KDOW and USACE by December 31st of each year (see Tables 19 and 20).

The components of the monitoring plan will include the following items:

As-Built Survey: Upon completion of restoration activities, an as-built drawing will be submitted to KDOW/USACE. It will include a longitudinal profile, cross sections, placed in representative habitat features (riffle, run, pool, glide) and a planview drawing.

Performed: Year 0 (post-construction)

Bank Erosion Hazard Index (BEHI): The erosion potential of each bank within the stream restoration area will be assessed according to methods described in Rosgen (2001). This method takes into account items such as soil type, bank angle, rooting depth, and vegetation coverage/type to produce a standardized score. Based in the score for a particular assessment reach the sediment loss can be predicted within an acceptable range of error.

Performed: Years 1, 3, 5

Bank Erosion Validation: The sediment production from banks and overall stability will be determined annually using a either horizontal/vertical bankpins or permanent cross sections. Additional photo documentation will be supplied at permanent stations spatially arranged at representative structures, outside meander bends, bank stabilizations, and in-channel habitat features.

Performed: Years 1-5

Hydrology: Flows greater than bankfull stage will be reported. These flows will be determine visually during high rain events or through the use of a strategically placed crest gauge. Water table elevation in wetland areas will be monitored monthly by using standard 3" diameter PVC monitoring wells.

Performed: Years 1-5

Vegetative Monitoring: Vegetation sample points will be set along the riparian/wetland planting zones that adequately represent the different existing habitats and proposed planting schemes. Vegetation monitoring points will be chosen in order to adequately characterize both wetland and non-wetland vegetative communities within the riparian zone. Reporting will include species composition, density, percent cover, dominant species per stratum, percent survival of planted trees and shrubs, percent exotics, and stems/acre for planted/volunteer trees and shrubs.

Performed: Years 1-5

Habitat assessment: USEPA habitat forms will be completed for each distinct project stream reach. High-gradient forms will be used upstream of US 127 and low-gradient forms will be used

downstream of US 127. Habitat assessment procedures follow those outlined in Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers (Barbour et al. 1999).

Performed: Years 1, 3, 5

Aquatic Biological Assessment: Fish and Macorinvertebrate assemblages will be determined and scored according to KDOW standard protocols. Additional statistical comparisons (Percent Similarity, Jaccard Similarity Indices, etc.) will be made between successive sample periods for each location to monitor trends.

Performed: Years 1, 3, 5

Table 19. Success criteria for Cove Spring Stream Restoration Project stream components.

Type/Category	Criteria	Year 1	Year 2	Year 3	Year 4	Final Value (after 5 years)
Geomorphology	BEHI (Max)	High (Below 35)		Moderate (Below 30)		Moderate (Below 25)
	Sediment Production From Banks (bankpins or crosssections)	Report annual sediment production from banks	Report annual sediment production from banks	Report annual sediment production from banks	Report annual sediment production from banks	Mean sediment production from banks less than 0.5 feet/year over years 3-5
	Stable banks and channel (photos)*	Assessed visually for instability. Photograph documentation annually	Assessed visually for instability. Photograph documentation annually	Assessed visually for instability. Photograph documentation annually	Assessed visually for instability. Photograph documentation annually	Assessed visually for instability. Photograph documentation annually
Hydrology	Crest gage or observation	Report greater than bankfull flows	Report greater than bankfull flows	Report greater than bankfull flows	Report greater than bankfull flows	Project must experience at least 3 bankfull flood events (or greater) before all credits are released
Vegetation	Min % Trees Native	50	60	70	80	90
	Max % Trees Exotic Non-invasive	50	40	30	20	10
	Max.% Trees Exotic Invasive	40	30	20	10	5
	Max % Exotic Invasive plants (herbaceous layer)	40	40	25	20	10
	Min. Native Stem Density per acre	150	150	150	300	300
	Maximum Percent any one tree Species	25	25	25	25	25

Type/Category	Criteria	Year 1	Year 2	Year 3	Year 4	Final Value (after 5 years)
	Species List (Scientific & Common Name, Wetland Status Indicator, Native vs. Non-Native vs. Invasive)	Yes	Yes	Yes	Yes	Yes
Habitat	RBP	Report RBP score		Report RBP score		Mean RBP score meets Table 14 projections by year 5
Biotic	USEPA RBP (benthics)	Sample year 1		Sample year 3		Sample year 5 <i>Equivalent or higher metrics and values than a compared reach that has not been restored</i>

Table 20. Success criteria for Cove Spring Stream Restoration Project wetland components.

Type/Category	Criteria	Initial Value	Year 1	Year 2	Year 3	Year 4	Final Value (after 5 years)
Hydrology	Surface Water and/or saturation soil within upper 12 inches	> / = 21 consecutive days of growing season	> / = 21 consecutive days of growing season	> / = 21 consecutive days of growing season	> / = 21 consecutive days of growing season	> / = 21 consecutive days of growing season	> / = 21 consecutive days of growing season
Soils	Soil series deemed to support hydric vegetation per Corps 1987 wetland delineation manual	Variable	Forming hydric features	Forming hydric features	Forming hydric features	Meets Corps wetland delineation manual soils criteria	Must meet Corps wetland delineation manual soils criteria
Vegetation	% Natives (by cover) - minimum	Variable	55%	55%	65%	65%	70%

Type/Category	Criteria	Initial Value	Year 1	Year 2	Year 3	Year 4	Final Value (after 5 years)
	% Non-Natives (by cover) - Maximum	Variable	30%	30%	25%	25%	20%
	% Invasives (by cover) - maximum	Variable	15%	15%	10%	10%	10-5%
	Stems per acre Natives	450	400	350	325	325	300
	*Importance value-maximum of any one species for site	Variable	0.6	0.6	0.5	0.5.	0.4
	Percent OBL, FACW+, FACW, FACW-, FAC+, FAC	Variable	>30%	>35%	>40%	>50%	>= 50% (with no more than 10% FAC)
	Species List (Scientific & Common Name, Wetland Status Indicator, Native vs. Non-Native vs. Invasive)		Yes	Yes	Yes	Yes	Yes

*Importance value is used here in place of aerial cover because much of the site has a substantial canopy of mature forest, which would limit the representation of immature woody plantings. The importance value is the sum of the relative density (number of stems per acre of a particular species divided by the total number of stems of all species per acre) and the relative frequency (number of plots in which a particular species is found divided by the number of occurrences of all species).

6.9 Long-Term Management Plan

KDFWR and CFPRD are committed to the long-term success of the mitigation project. Streams and wetlands are some of the most prominent features of Cove Spring Park, and all interested parties recognize that they are essential to the functional and aesthetic value of the park and the surrounding landscape. CFPRD intends to maintain these features as-needed in perpetuity in order to foster healthy ecosystems and ecological awareness of its citizens.

6.10 Adaptive Management Plan

The adaptive management plan is intended to address unforeseen changes in site conditions or other components of the compensatory mitigation project. The adaptive management plan will guide decisions for revising compensatory mitigation plans and implementing measures to address both foreseeable and unforeseen circumstances that adversely affect compensatory mitigation success. In general the following guidelines will be followed by KDFWR:

- If the compensatory mitigation project cannot be constructed in accordance with the proposed mitigation plan, KDFWR will notify USACE/KDOW and seek guidance for approved remedies.
- If monitoring or other information indicates that the compensatory mitigation project is not progressing towards meeting its performance standards as anticipated, KDFWR will notify USACE/KDOW as soon as possible and seek guidance for approved remedies.
- Approved remedies may include site modifications, design changes, revisions to maintenance requirements, and/or revised monitoring requirements. The measures will be designed to ensure that the modified compensatory mitigation project provides aquatic resource functions comparable to those described in the mitigation plan objectives.

6.11 Financial Assurances

KDFWR has set aside 10% of the project cost as contingency funds. These funds are available to cover unanticipated items and long-term maintenance.

7. Summary

Stream restoration activities are proposed along approximately 7,203 linear feet of Penitentiary Branch, Cove Spring Run, and Holly Branch. Restoration will involve bank stabilization, in-stream stabilizing structures, and re-establishment of native vegetation. Structures will enhance the stability of the stream by decreasing head cutting and lateral cutting. In-stream structures will also increase stormwater filtration, increase habitat heterogeneity, and provide epifaunal substrate. The proposed project should increase the RBP stream habitat score of stream segments in the project area from poor ratings to average and excellent ratings. In all, 43.92

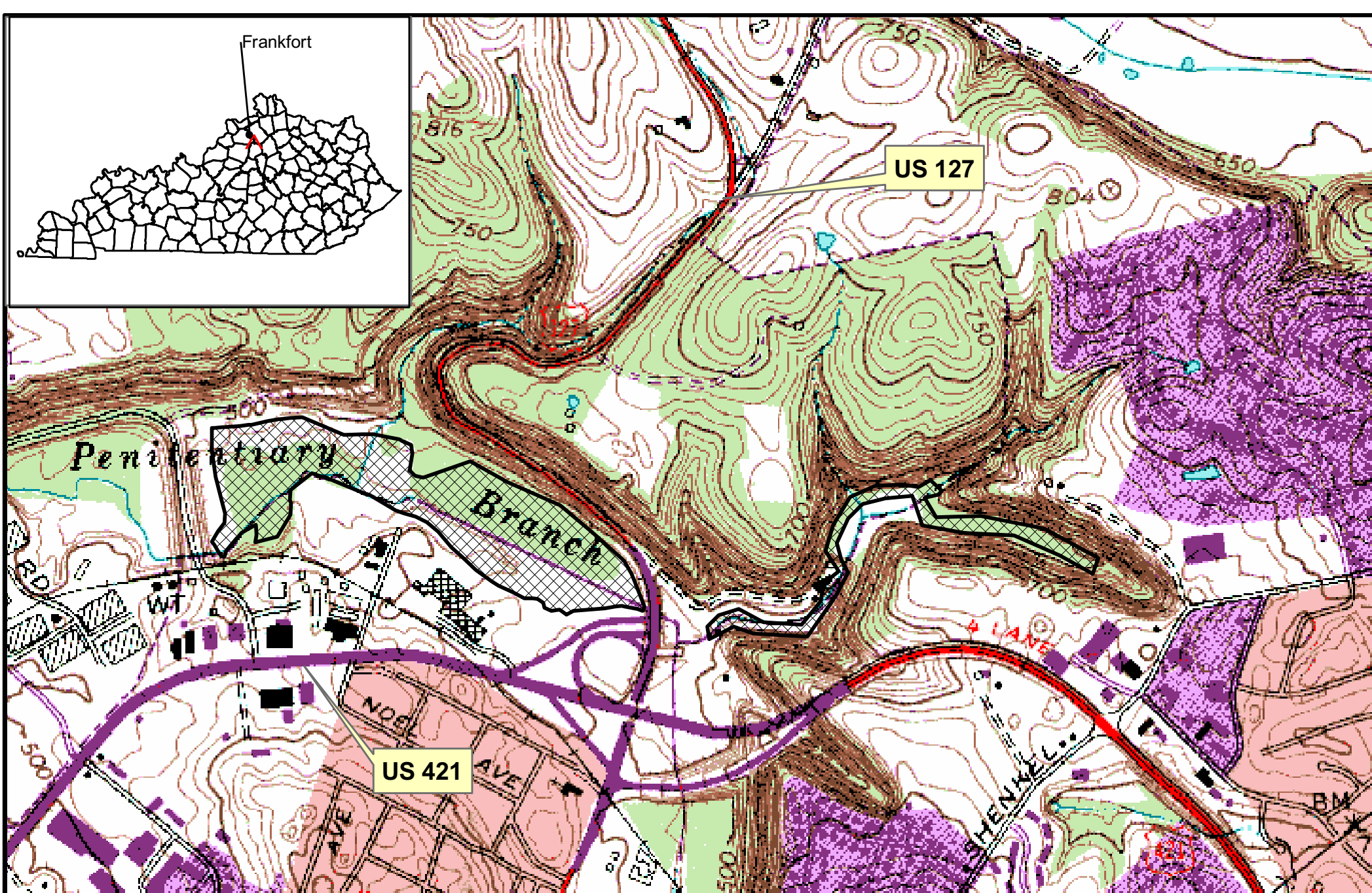
acres of riparian habitat will be restored, enhanced and/or preserved. The project should also increase the biotic integrity of the stream and will provide approximately 9,236 AMUs. In addition to stream restoration, approximately 3.4 acres of palustrine emergent wetland and 11.0 acres of palustrine forested wetland will be created.

Literature Cited

- Barbour, M. T., J. Gerritsen, B.D. Snyder, and J.B. Stribling. 1999. Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish, Second Edition. EPA 841-B-99-002. U.S. Environmental Protection Agency; Office of Water; Washington, D.C.
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- Woods, Alan J., J. M. Omernik, W. H. Martin, G. J. Pond, W. M. Andrews, S. M. Call, J. A. Comstock, and D. D. Taylor. 2002. Ecoregions of Kentucky (color poster with map, descriptive text, summary tables, and photographs): Reston, VA., U.S. Geological Survey (map scale 1:1,000,000).

Figures

- Figure 1. Project Vicinity Topographic Map with Limits of Disturbance**
- Figure 2. Project Site Aerial Map with Limits of Disturbance**
- Figure 3a-3b. Jurisdictional Features Mapping**
- Figure 4. Rapid Bioassessment Protocol (RBP) Datasheet Reaches**
- Figure 5. Existing and Proposed Wetlands and Open Water**
- Figure 6. Estimate of Post-Restoration Wetland and Open Water Over Aerial Photo**



Project Area

**Cove Spring Stream Restoration
Frankfort, KY**

Imagery Source:
USGS 7.5 Minute Topographic Map

Figure 1: Project Vicinity Map



Drawn by: TTB
Print Date: 4/3/09
Prepared For: City of Frankfort

ETC File: FT2008010



Project Area

Cove Spring Stream Restoration Frankfort, KY

Imagery Source:
NAIP 2 ft Imagery

**Figure 2: Project Area
Over 2006 Aerial Photograph**



Drawn by: TTB
Print Date: 4/3/09
Prepared For: City of Frankfort

ETC File: FT2008010



a	Culvert	c	Spring
			Intermittent Stream(i)
			Perennial Stream(p)
			Ephemeral Stream(e)

FIGURE 3a. JWD FEATURES MAP
 Jurisdictional Waters Determination
 for the Cove Springs Stream Restoration Project,
 Franklin County, Kentucky
 FSA 2004 NAIP DOQQ

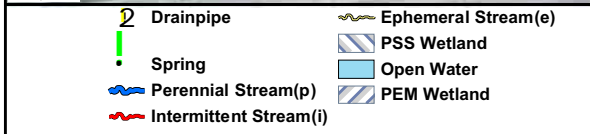
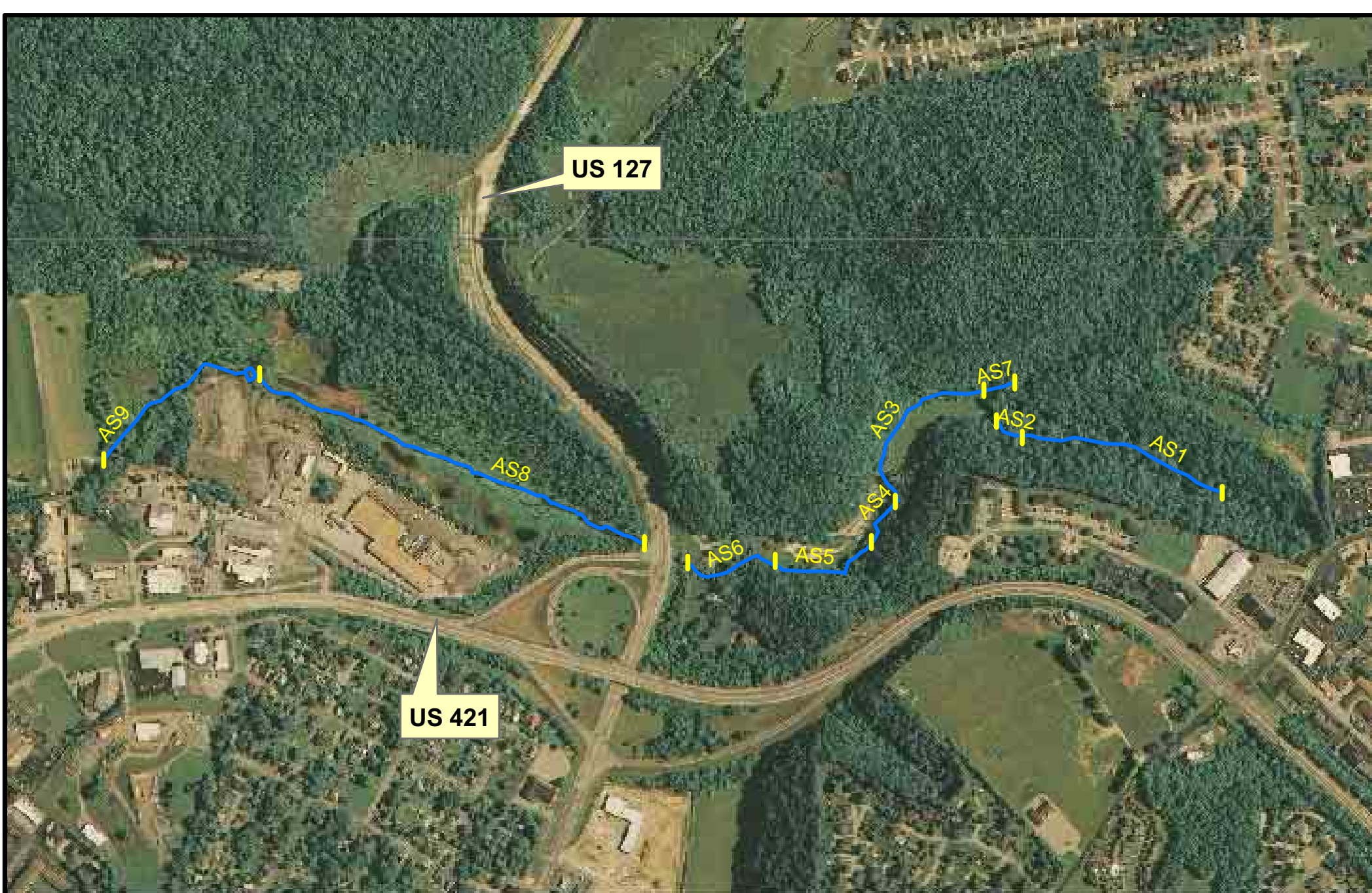


FIGURE 3b. JWD FEATURES MAP
 Jurisdictional Waters Determination
 for the Cove Springs Stream Restoration Project,
 Franklin County, Kentucky
 FSA 2004 NAIP DOQQ



Cove Spring Stream Restoration
Frankfort, KY

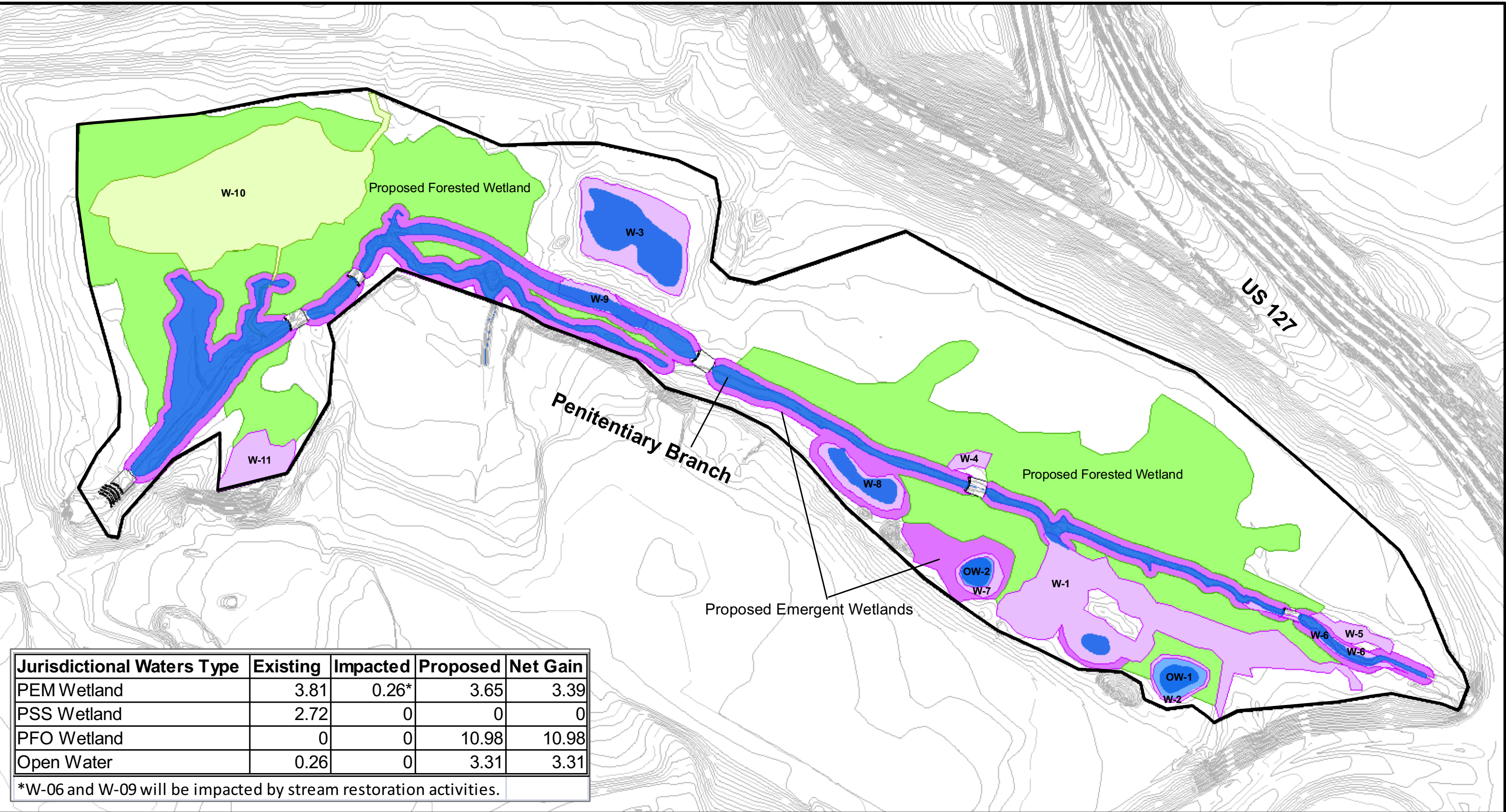
Imagery Source:
NAIP 2 ft Imagery

**Figure 4: RBP Assessment Reaches
Over 2006 Aerial Photograph**



Drawn by: TTB
Print Date: 4/3/09
Prepared For: City of Frankfort

ETC File: FT2008010



**Cove Spring Stream Restoration
Wetland Creation Areas
Franklin County, KY**

0 105 210 420 630 840 Feet

Imagery Source: KY 2006 Winter Aerial Photo

FIGURE 5 Proposed Wetland Creation Areas

Legend

Existing Wetlands

PSS

Existing Open Water

Proposed Wetland Creation

PEM

PFO

Contours and Design


Bndry

Permanent WSE

EX-Cont-Major

EX-Cont-Minor

Struct



Drawn by: TTB Print Date: 09/10/09

Prepared for: KDFWR Stream Restoration Team

ETC File: FT2008010



1 inch equals 200 feet







**Cove Spring Stream Restoration
Wetland Creation Areas
Franklin County, KY**

0 105 210 420 630 840 Feet

Imagery Source: KY 2006 Winter Aerial Photo

FIGURE 6
**Estimate of Post-Restoration
Wetland and Open Water Habitat**

Legend

- | | |
|---|--------------------------------------|
|  Open Water | Contours and Design
Layer |
|  Wetlands | |
|  Bndry | |
|  EX-Cont-Major | |
|  EX-Cont-Minor | |
|  Struct | |



Drawn by: TTB	Print Date: 09/10/09
Prepared for: KDFWR Stream Restoration Team	
ETC File: FT2008010	

Conceptual Stream Restoration Plan

Completed by Biohabitats, Inc. (2009)

- **Stream Assessment and Design Rationale**
- **Geometry Plans**
- **Grading and Sediment and Erosion Control Plans**
- **Stream Profiles**
- **Detail Sheets**
- **Cross Sections**
- **Planting Maps**
- **Planting Schedules**
- **Planting Details and Notes**
- **Erosion and Sediment Control Details**

Attachment 1

Application for Department of the Army Permit

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT
(33 CFR 325)

OMB APPROVAL NO. 0710-0003
Expires December 31, 2004

The Public burden for this collection of information is estimated to average 10 hours per response, although the majority of applications should require 5 hours or less. This includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Service Directorate of Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302; and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003), Washington, DC 20503. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Please DO NOT RETURN your form to either of those addresses. Completed applications must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research and Sanctuaries Act, Section 103, 33 USC 1413. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued.

One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

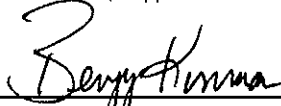
1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETED
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(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME Benjy Kinman, Deputy Commissioner, KDFWR	8. AUTHORIZED AGENT'S NAME AND TITLE <i>(an agent is not required)</i> T. Travis Brown
6. APPLICANT'S ADDRESS # 1 Sportsman's Lane Frankfort, KY 40601	9. AGENT'S ADDRESS 100 West Court Avenue, Suite 102; Jeffersville, IN 47130
7. APPLICANT'S PHONE NOS. W/AREA CODE a. Residence b. Business 502 564 7109	10. AGENT'S PHONE NOS. W/AREA CODE a. Residence 502-322-4034 b. Business 812-280-2200

11. STATEMENT OF AUTHORIZATION

I hereby authorize, T. Travis Brown to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.


APPLICANT'S SIGNATURE

6/15/09
DATE

NAME, LOCATION AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE *(see instructions)*

Cove Spring Stream Restoration Project

13. NAME OF WATERBODY, IF KNOWN *(if applicable)*

Penitentiary Branch and Tributaries

14. PROJECT STREET ADDRESS *(if applicable)*

15. LOCATION OF PROJECT

Franklin

COUNTY

KY

STATE

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN, *(see instructions)*

The project is located directly north of the intersection of US 127 and US 421 on the east and west side of US 127.

17. DIRECTIONS TO THE SITE

The Cove Spring stream restoration site is located approximately two miles north of downtown of Frankfort, KY. The portion of Penitentiary Branch involved in the restoration is located on both sides of US 127 at its intersection with US 421 within the Frankfort city limits. See also supporting documents.

18. Nature of Activity (Description of project, include all features)

This is a stream restoration project. Construction will involve the placement of in-stream structures such as rock weirs, J-hook, and parabolic rock structures. Berms will be added adjacent to the stream within the 100-year floodplain in order to stabilize some of these structures. In portions of the project area, eroded banks will be graded to produce a more stable bankfull bench type of cross-section. See also supporting documents.

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

The purpose of the project is to restore in-stream and riparian habitat at Cove Spring Park. See also supporting documents.

USE BLOCKS 20-22 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

In order to restore habitat conditions some fill, associated with stream restoration structures, will be necessary. See also supporting documents.

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Existing streams and wetlands will be expanded and enhanced as a result of this project

23. Is Any Portion of the Work Already Complete? Yes ☐ No ☒ IF YES, DESCRIBE THE COMPLETED WORK

24. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (If more than can be entered here, please attach a supplemental list).

NA

25. List of Other Certifications or Approvals/Denials Received from other Federal, State or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL *	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED

*Would include but is not restricted to zoning, building and flood plain permits

26. Application is hereby made for a permit or permits to authorize the work described in this application. I certify that the information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

Benny Kuma
SIGNATURE OF APPLICANT

6/15/05
DATE

SIGNATURE OF AGENT

DATE

The application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than \$10,000 or imprisoned not more than five years or both.

**Instructions for Preparing a
Department of the Army Permit Application**

Blocks 1 through 4. To be completed by Corps of Engineers.

Block 5. Applicant's Name. Enter the name of the responsible party or parties. If the responsible party is an agency, company, corporation or other organization, indicate the responsible officer and title. If more than one party is associated with the application, please attach a sheet with the necessary information marked **Block 5**.

Block 6. Address of Applicant. Please provide the full address of the party or parties responsible for the application. If more space is needed, attach an extra sheet of paper marked Block 6.

Block 7. Applicant Telephone Number(s). Please provide the number where you can usually be reached during normal business hours.

Blocks 8 through 11. To be completed if you choose to have an agent.

Block 8. Authorized Agent's Name and Title. Indicate name of individual or agency, designated by you, to represent you in this process. An agent can be an attorney, builder, contractor, engineer or any other person or organization. Note: An agent is not required.

Blocks 9 and 10. Agent's Address and Telephone Number. Please provide the complete mailing address of the agent, along with the telephone number where he/she can be reached during normal business hours.

Block 11. Statement of Authorization. To be completed by applicant if an agent is to be employed.

Block 12. Proposed Project Name or Title. Please provide name identifying the proposed project (i.e., Landmark Plaza, Burned Hills Subdivision or Edsall Commercial Center).

Block 13. Name of Waterbody. Please provide the name of any stream, lake, marsh or other waterway to be directly impacted by the activity. If it is a minor (no name) stream, identify the waterbody the minor stream enters.

Block 14. Proposed Project Street Address. If the proposed project is located at a site having a street address (not a box number), please enter here.

Block 15. Location of Proposed Project. Enter the county and state where the proposed project is located. If more space is required, please attach a sheet with the necessary information marked Block 15.

Block 16. Other Location Descriptions. If available, provide the Section, Township and Range of the site and/or the latitude and longitude. You may also provide description of the proposed project location, such as lot numbers, tract numbers or you may choose to locate the proposed project site from a known point (such as the right descending bank of Smith Creek, one mile down from the Highway 14 bridge). If a large river or stream, include the river mile of the proposed project site if known.

Block 17. Directions to the Site. Provide directions to the site from a known location or landmark. Include highway and street numbers as well as names. Also provide distances from known locations and any other information that would assist in locating the site.

Block 18. Nature of Activity. Describe the overall activity or project. Give appropriate dimensions of structures such as wingwalls, dikes (identify the materials to be used in construction, as well as the methods by which the work is to be done), or excavations (length, width, and height). Indicate whether discharge of dredged or fill material is involved. Also, identify any structure to be constructed on a fill, piles or float supported platforms.

The written descriptions and illustrations are an important part of the application. Please describe, in detail, what you wish to do. If more space is needed, attach an extra sheet of paper marked **Block 18**.

Block 19. Proposed Project Purpose. Describe the purpose and need for the proposed project. What will it be used for and why? Also include a brief description of any related activities to be developed as the result of the proposed project. Give the approximate dates you plan to both begin and complete all work.

Block 20. Reason(s) for Discharge. If the activity involves the discharge of dredged and/or fill material into a wetland or other waterbody, including the temporary placement of material, explain the specific purpose of the placement of the material (such as erosion control).

Block 21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards. Describe the material to be discharged and amount of each material to be discharged within Corps jurisdiction. Please be sure this description will agree with your illustrations. Discharge material includes: rock, sand, clay, concrete, etc.

Block 22. Surface Areas of Wetlands or Other Waters Filled. Describe the area to be filled at each location. Specifically identify the surface areas, or part thereof, to be filled. Also include the means by which the discharge is to be done (backhoe, dragline, etc.). If dredged material is to be discharged on an upland site, identify the site and the steps to be taken (if necessary) to prevent runoff from the dredged material back into a waterbody. If more space is needed, attach an extra sheet of paper marked **Block 22**.

Block 23. Is Any Portion of the Work Already Complete? Provide any background on any part of the proposed project already completed. Describe the area already developed, structures completed, any dredged or fill material already discharged, the type of material, volume in cubic yards, acres filled, if a wetland or other waterbody (in acres or square feet). If the work was done under an existing Corps permit, identify the authorization if possible.

Block 24. Names and Addresses of Adjoining Property Owners, Lessees, etc., Whose Property Adjoins the Project Site. List complete names and full mailing addresses of the adjacent property owners (public and private) lessees, etc., whose property adjoins the waterbody or aquatic site where the work is being proposed so that they may be notified of the proposed activity (usually by public notice). If more space is needed, attach an extra sheet of paper marked Block 24.

Information regarding adjacent landowners is usually available through the office of the tax assessor in the county of counties where the project is to be developed.

Block 25. Information about Approvals or Denials by Other Agencies. You may need the approval of other Federal, state or local agencies for your project. Identify any applications you have submitted and the status, if any (approved or denied) of each application. You need not have obtained all other permits before applying for a Corps permit.

Block 26. Signature of Applicant or Agent. The application must be signed by the owner or other authorized party (agent) . This signature shall be an affirmation that the party applying for the permit possesses the requisite property rights to undertake the activity applied for (including compliance with special conditions, mitigation, etc.).

DRAWINGS AND ILLUSTRATIONS

General Information.

Three types of illustrations are needed to properly depict the work to be undertaken. These illustrations or drawings are identified as a **Vicinity Map**, a **Plan View** or a **Typical Cross-Section Map**. Identify each illustration with a figure or attachment number.

Please submit one original, or good quality copy, of all drawings on 8 1/2x11 inch plain white paper (tracing paper or film may be substituted). Use the fewest number of sheets necessary for your drawings or illustrations.

Each illustration should identify the project, the applicant, and the type of illustration (vicinity map, plan view or cross-section) . **While illustrations need not be professional (many small, private project illustrations are prepared by hand), they should be clear, accurate and contain all necessary information.**

Attachment 2

KDOW Water Quality Certification Application

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES & ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER

**APPLICATION FOR PERMIT TO CONSTRUCT ACROSS OR ALONG A STREAM
AND / OR WATER QUALITY CERTIFICATION**

Chapter 151 of the Kentucky Revised Statutes requires approval from the Division of Water prior to any construction or other activity in or along a stream that could in any way obstruct flood flows or adversely impact water quality. *If the project involves work in a stream, such as bank stabilization, dredging or relocation, you will also need to obtain a 401 Water Quality Certification (WQC) from the Division of Water.* This completed form will be forwarded to the Water Quality Branch for WQC processing. The project may not start until all necessary approvals are received from the KDOW. For questions concerning the WQC process, contact the WQC section at 502/564-3410.

If the project will disturb more than 1 acre of soil, you will also need to complete the attached Notice of Intent for Storm Water Discharges, and return both forms to the Floodplain management Section of the KDOW. This general permit will require you to create an implement an erosion control plan for the project.

1. **OWNER:** Benjy Kinman, Kentucky Department of Fish and Wildlife Resources
Give name of person(s), company, governmental unit, or other owner of proposed project.

MAILING ADDRESS 1 Sportsman Lane Frankfort, KY 40601

TELEPHONE #: 502-564-7109 **EMAIL:** Benjy.kinman@ky.gov

2. **AGENT:** Travis Brown, Staff Ecologist, Eco-Tech Consultants, Inc.
Give name of person(s) submitting application, if other than owner.

ADDRESS: 100 West Court Ave, Suite 102; Jeffersonville, IN 47130

TELEPHONE #: 812-280-2200 **EMAIL:** tbrown@ecotechinc.com

3. **ENGINEER:** N/A **P.E. NUMBER:** N/A
Contact Division of Water if waiver can be granted.

TELEPHONE #: N/A **EMAIL:** N/A

4. **DESCRIPTION OF CONSTRUCTION**
Describe the type and purpose of construction and describe stream impact

This is a stream restoration project in a city park and adjacent properties. Construction will involve the placement of in-stream structures such as rock weirs, J-hook, and parabolic rock structures, Berms will be added adjacent to the stream within the 100 year floodplain in order to stabilize some of these structures. In portions of the project area, eroded banks will be graded to produce a more stable bankfull bench type of cross-section. See also supporting documents.

5. **COUNTY:** Franklin **NEAREST COMMUNITY:** Frankfort

6. **USGS QUAD NAME:** Frankfort East **LATITUDE/LONGITUDE:** 38.218417/-84.848343

7. **STREAM NAME:** Penitentiary Branch **WATERSHED SIZE (in acres):** 2163

8. **LINEAR FEET OF STREAM IMPACTED:** 7203

9. **DIRECTIONS TO SITE:** _____

The Cove Spring stream restoration site is located approximately two miles north of downtown of Frankfort, KY. The portion of Penitentiary Branch involved in the restoration is located on both sides of US 127 at its intersection with US 421 within the Frankfort city limits. See also supporting documents.

10. IS ANY PORTION OF THE REQUESTED PROJECT NOW COMPLETE? ☐ Yes ☒ No If yes, identify the completed portion on the drawings you submit and indicate the date activity was completed. DATE:
11. ESTIMATED BEGIN CONSTRUCTION DATE: November 2010
12. ESTIMATED END CONSTRUCTION DATE: February 2011
13. HAS A PERMIT BEEN RECEIVED FROM THE US ARMY, CORPS of ENGINEERS? ☐ Yes ☒ No If yes, attach a copy of that permit.
14. THE APPLICANT **MUST** ADDRESS PUBLIC NOTICE:
- (a) PUBLIC NOTICE HAS BEEN GIVEN FOR THIS PROPOSAL BY THE FOLLOWING MEANS:
- Public notice in newspaper having greatest circulation in area (provide newspaper clipping or affidavit)
- Adjacent property owner(s) affidavits (Contact Division of Water for requirements.)
- (b) X I REQUEST WAIVER OF PUBLIC NOTICE BECAUSE: not applicable
-
- Contact Division of Water for requirements.
15. I HAVE CONTACTED THE FOLLOWING CITY OR COUNTY OFFICIALS CONCERNING THIS PROJECT:
- Project is being coordinated with the city of Frankfort, as it occurs in a city park
Give name and title of person(s) contacted and provide copy of any approval city or county may have issued.
16. LIST OF ATTACHMENTS: USACE Mitigation Plan (includes 7.5 minute USGS topographic map)
List plans, profiles, or other drawings and data submitted. Attach a copy of a 7.5 minute USGS topographic map clearly showing the project location.
17. I, Benjy Kinnman (owner) CERTIFY THAT THE OWNER OWNS OR HAS EASEMENT RIGHTS ON ALL PROPERTY ON WHICH THIS PROJECT WILL BE LOCATED OR ON WHICH RELATED CONSTRUCTION WILL OCCUR (for dams, this includes the area that would be impounded during the design flood).
18. REMARKS:

I hereby request approval for construction across or along a stream as described in this application and any accompanying documents.
To the best of my knowledge, all the information provided is true and correct.

SIGNATURE: Benjy Kinnman

DATE: 6/15/07

SIGNATURE OF LOCAL FLOODPLAIN COORDINATOR:

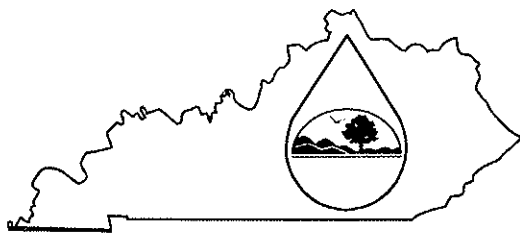
Permit application will be returned to applicant if not properly endorsed by the local floodplain coordinator.

DATE:

SUBMIT APPLICATION AND ATTACHMENTS TO:

Floodplain Management Section
Division of Water
14 Reilly Road
Frankfort, KY 40601

KPDES FORM NOI-SW



Kentucky Pollutant Discharge Elimination System
(KPDES)

Notice of Intent (NOI) for Storm Water Discharges Associated with Industrial Activity Under the KPDES General Permit

Submission of this Notice of Intent constitutes notice that the party identified in Section I of this form intends to be authorized by a KPDES permit issued for storm water discharges associated with industrial activity. Becoming a permittee obligates such discharger to comply with the terms and conditions of the permit.

ALL NECESSARY INFORMATION MUST BE PROVIDED ON THIS FORM (See Instructions on back)

I. Facility Operator Information

Name:	Kentucky Department of Fish and Wildlife Resources	Phone:	502-564-7109 x 4547
Address:	1 Sportsman Lane	Status of Owner/Operator:	S
City, State, Zip Code:	Frankfort, KY 40601		

II. Facility/Site Location Information

Name:	Penitentiary Branch		
Address:	Cove Spring City Park		
City, State, Zip Code:	Frankfort, KY 40601		
County:	Franklin		
Site Latitude: (degrees/minutes/seconds)	38.218417	Site Longitude: (degrees/minutes/seconds)	-84.848343

III. Site Activity Information

MS4 Operator Name:	N/A			
Receiving Water Body:	Kentucky River			
Are there existing quantitative data?	Yes <input type="checkbox"/> If Yes, submit with this form. No <input checked="" type="checkbox"/>			
SIC or Designated Activity Code Primary		2nd	3rd	4th
If this facility is a member of a Group Application, enter Group Application Number:				
If you have other existing KPDES Permits, enter Permit Numbers:		N/A		

IV. Additional Information Required FOR CONSTRUCTION ACTIVITIES ONLY

Project Start Date:	November 2009	Completion Date:	February 2010
Estimated Area to be disturbed (in acres):	7		
Is the Storm Water Pollution Prevention Plan in Compliance with State and/or Local Sediment and Erosion Plans?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		

V. Certification: I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Printed or Typed Name:	BENNY KINMAN		
Signature:	Benny Kinman		Date: 6/15/09

**Kentucky Pollutant Discharge Elimination System (KPDES)
Instructions
Notice of Intent (NOI) for Storm Water Discharges Associated with Industrial Activity
To Be Covered Under The KPDES General Permit**

WHO MUST FILE A NOTICE OF INTENT (NOI) FORM

Federal law at 40 CFR Part 122 prohibits point source discharges of stormwater associated with industrial activity to a water body of the Commonwealth of Kentucky without a Kentucky Pollutant Discharge Elimination System (KPDES) permit. The operator of an industrial activity that has such a storm water discharge must submit a NOI to obtain coverage under the KPDES Storm Water General Permit. If you have questions about whether you need a permit under the KPDES Storm Water program, or if you need information as to whether a particular program is administered by the state agency, call the **Storm Water Contact, Industrial Section, Kentucky Division of Water at (502) 564-3410.**

WHERE TO FILE NOI FORM

NOIs must be sent to the following address:

**Section Supervisor
Inventory & Data Management Section
KPDES Branch, Division of Water
Frankfort Office Park
14 Reilly Road
Frankfort, KY 40601**

COMPLETING THE FORM

Type or print legibly in the appropriate areas only. If you have any questions regarding the completion of this form call the **Storm Water Contact, Industrial Section, at (502) 564-3410.**

SECTION I - FACILITY OPERATOR INFORMATION

Give the legal name of the person, firm, public organization, or any other entity that operates the facility or site described in this application. The name of the operator may or may not be the same as the name of the facility. The responsible party is the legal entity that controls the facility's operation, rather than the plant or site manager. Do not use a colloquial name. Enter the complete address and telephone number of the operator.

Enter the appropriate letter to indicate the legal status of the operator of the facility.

F = Federal M = Public (other than federal or state)
S = State P = Private

SECTION II - FACILITY/SITE LOCATION INFORMATION

Enter the facility's or site's official or legal name and complete street address, including city, state, and ZIP code.

SECTION III - SITE ACTIVITY INFORMATION

If the storm water discharges to a municipal separate storm sewer system (MS4), enter the name of the operator of the MS4 (e.g., municipality name, county name) and the receiving water of the discharge from the MS4. (A MS4 is defined as a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) that is owned or operated by a state, city, town, borough, county, parish, district, association, or other public body which is designed or used for collecting or conveying storm water.)

If the facility discharges storm water directly to receiving water(s), enter the name of the receiving water.

Indicate whether or not the owner or operator of the facility has existing quantitative data that represent the characteristics and concentration of pollutants in storm water discharges. If data is available submit with this form.

List, in descending order of significance, up to four 4-digit standard industrial classification (SIC) codes that best describe the principal products or services provided at the facility or site identified in Section II of this application.

If the facility listed in Section II has participated in Part 1 of an approved storm water group application and a group number has been assigned, enter the group application number in the space provided.

If there are other KPDES permits presently issued for the facility or site listed in Section II, list the permit numbers.

SECTION IV - ADDITIONAL INFORMATION REQUIRED FOR CONSTRUCTION ACTIVITIES ONLY

Construction activities must complete Section IV in addition of Sections I through III. Only construction activities need to complete Section IV.

Enter the project start date and the estimated completion date for the entire development plan.

Provide an estimate of the total number of acres of the site on which soil will be disturbed (round to the nearest acre).

Indicate whether the storm water pollution prevention plan for the site is in compliance with approved state and/or local sediment and erosion plans, permits, or storm water management plans.

SECTION V - CERTIFICATION

Federal statutes provide for severe penalties for submitting false information on this application form. Federal regulations require this application to be signed as follows:

For a corporation: by a responsible corporate officer, which means: (i) president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions, or (ii) the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding \$25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

For a partnership or sole proprietorship: by a general partner or the proprietor; or *For a municipality, state, Federal, or other public facility:* by either a principal executive officer or ranking elected official.

Attachment 3

Preliminary Jurisdictional Determination Form

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR PRELIMINARY JURISDICTIONAL DETERMINATION (JD): Dec. 19, 2008

B. NAME AND ADDRESS OF PERSON REQUESTING PRELIMINARY JD:

Applicant: Nick Ozburn, KY Department of Fish and Wildlife Resources, Stream and Wetland Mitigation Program; #1 Sportsman's Lane; Frankfort, KY 40601

Agent: Lee Droppelman, Eco-Tech Consultants; Inc. 931 East Main Street; Frankfort, KY 40601

C. DISTRICT OFFICE, FILE NAME, AND NUMBER:

D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION: see attached permit application materials
(USE THE ATTACHED TABLE TO DOCUMENT MULTIPLE WATERBODIES AT DIFFERENT SITES)

State: KY County/parish/borough: Franklin City: Frankfort

Center coordinates of site (lat/long in degree decimal format): Lat. 38.217800° N, Long. -84.850689° W.

Universal Transverse Mercator: 4232164.5 N

688154.44 E

Name of nearest waterbody: Penitentiary Branch

Identify (estimate) amount of waters in the review area:

Non-wetland waters: 18495 linear feet: 0.5-18 ft width (ft) of stream and 0.26 ac acres of open water (PUB3H).

Cowardin Class: Riverine and Palustrine

Stream Flow: Ephemeral, Intermittent, and Perennial

Wetlands: 6.53 acres.

Cowardin Class: Emergent and Shrub Scrub

(see also Table 1)

Name of any water bodies on the site that have been identified as Section 10 waters:

Tidal:

Non-Tidal:

E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☐ Office (Desk) Determination. Date:

☐ Field Determination. Date(s):

1. The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this preliminary JD has declined to exercise the option to obtain an approved JD in this instance and at this time.

2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which does not make an official determination of jurisdictional waters; (2) that the applicant has the option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable. This preliminary JD finds that there "*may be*" waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

SUPPORTING DATA. Data reviewed for preliminary JD (check all that apply

- checked items should be included in case file and, where checked and requested, appropriately reference sources below):

☐ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: .

☐ Data sheets prepared/submitted by or on behalf of the applicant/consultant.

☐ Office concurs with data sheets/delineation report.

☐ Office does not concur with data sheets/delineation report.

☐ Data sheets prepared by the Corps: .

☐ Corps navigable waters' study: .

☐ U.S. Geological Survey Hydrologic Atlas: .

☐ USGS NHD data.

☐ USGS 8 and 12 digit HUC maps.

☐ U.S. Geological Survey map(s). Cite scale & quad name: .

☐ USDA Natural Resources Conservation Service Soil Survey. Citation:

.

☐ National wetlands inventory map(s). Cite name: .

☐ State/Local wetland inventory map(s): .

☐ FEMA/FIRM maps: .

☐ 100-year Floodplain Elevation is: (National Geodetic Vertical Datum of 1929)

☐ Photographs: ☐ Aerial (Name & Date): .

or ☐ Other (Name & Date): .

☐ Previous determination(s). File no. and date of response letter: .

☐ Other information (please specify): .

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

Signature and date of
Regulatory Project Manager
(REQUIRED)

Signature and date of
person requesting preliminary JD
(REQUIRED, unless obtaining
the signature is impracticable)

Table 1. Aquatic resources in the Cove Spring Stream Resoration project area.

Site number	Latitude	Longitude	Cowardin Class	Estimated amount of aquatic resource in review area	Class of aquatic resource
S-01(E)	38.2186423	-84.8409648	Ephemeral	513 linear feet	non-section 10 – non-wetland
S-01(I)	38.2203486	-84.8459643	Intermittent (R4SB3)	2427 linear feet	non-section 10 – non-wetland
S-01(P)	38.2177178	-84.8488819	Perennial (R3RB1/UB1)	1497 linear feet	non-section 10 – non-wetland
S-02(E)	38.2186515	-84.8404680	Ephemeral	116 linear feet	non-section 10 – non-wetland
S-03(E)	38.2190217	-84.8418354	Ephemeral	119 linear feet	non-section 10 – non-wetland
S-04(E)	38.2193173	-84.8421815	Ephemeral	205 linear feet	non-section 10 – non-wetland
S-05(E)	38.2193958	-84.8428081	Ephemeral	72 linear feet	non-section 10 – non-wetland
S-06(I)	38.2224834	-84.8413441	Intermittent (R4SB3)	1255 linear feet	non-section 10 – non-wetland
S-06(P)	38.2215438	-84.8426807	Perennial (R3RB1/UB1)	515 linear feet	non-section 10 – non-wetland
S-07(E)	38.2214520	-84.8424733	Ephemeral	114 linear feet	non-section 10 – non-wetland
S-08(P)	38.2208555	-84.8442631	Perennial (R3RB1/UB1)	135 linear feet	non-section 10 – non-wetland
S-09(E)	38.2243106	-84.8443618	Ephemeral	564 linear feet	non-section 10 – non-wetland
S-09(I)	38.2225730	-84.8433474	Intermittent (R4SB3)	827 linear feet	non-section 10 – non-wetland
S-10(E)	38.2244150	-84.8441386	Ephemeral	159 linear feet	non-section 10 – non-wetland
S-11(E)	38.2238151	-84.8440989	Ephemeral	66 linear feet	non-section 10 – non-wetland
S-12(E)	38.2235987	-84.8435500	Ephemeral	35 linear feet	non-section 10 – non-wetland
S-13(E)	38.2235953	-84.8431061	Ephemeral	173 linear feet	non-section 10 – non-wetland
S-14(E)	38.2216148	-84.8457133	Ephemeral	876 linear feet	non-section 10 – non-wetland
S-15(E)	38.2216049	-84.8458009	Ephemeral	91 linear feet	non-section 10 – non-wetland
S-16(E)	38.2237630	-84.8476981	Ephemeral	1291 linear feet	non-section 10 – non-wetland
S-16(I)	38.2206269	-84.8476692	Intermittent (R4SB3)	399 linear feet	non-section 10 – non-wetland
S-17(E)	38.2237125	-84.8473355	Ephemeral	337 linear feet	non-section 10 – non-wetland
S-18(E)	38.2228178	-84.8483016	Ephemeral	104 linear feet	non-section 10 – non-wetland
S-19(E)	38.2174992	-84.8480573	Ephemeral	352 linear feet	non-section 10 – non-wetland
S-20(E)	38.2192323	-84.8477872	Ephemeral	82 linear feet	non-section 10 – non-wetland
S-21(P)	38.2187886	-84.8473622	Perennial (R3RB1/UB1)	175 linear feet	non-section 10 – non-wetland
S-22(E)	38.2181898	-84.8481632	Ephemeral	181 linear feet	non-section 10 – non-wetland
S-23(E)	38.2183081	-84.8504620	Ephemeral	254 linear feet	non-section 10 – non-wetland
S-23(I)	38.2187287	-84.8506451	Intermittent (R4SB3)	68 linear feet	non-section 10 – non-wetland
S-24(P)	38.2173525	-84.8517851	Perennial (R3RB1/UB1)	606 linear feet	non-section 10 – non-wetland
S-25(P)	38.2190636	-84.8549254	Perennial (R3RB1/UB1)	3740 linear feet	non-section 10 – non-wetland
S-26(P)	38.2187975	-84.8548143	Perennial (R3RB1/UB1)	661 linear feet	non-section 10 – non-wetland
S-27(E)	38.2218528	-84.8581940	Ephemeral	486 linear feet	non-section 10 – non-wetland
W-01	38.2186521	-84.8547141	PEM1E	1.78 ac	non-section 10 – wetland
W-02	38.2184222	-84.8545143	PEM1H	0.05 ac	non-section 10 – wetland
W-03	38.2208907	-84.8585826	PEM1E	0.91 ac	non-section 10 – wetland
W-04	38.2196045	-84.8560626	PEM1E	0.06 ac	non-section 10 – wetland

W-05	38.2185527	-84.8532183	PEM1E	0.11 ac	non-section 10 – wetland
W-06	38.2184922	-84.8534134	PEM1E	0.1 ac	non-section 10 – wetland
W-07	38.2188472	-84.8559234	PEM1H	0.08 ac	non-section 10 – wetland
W-08	38.2194947	-84.8569166	PEM1E	0.27 ac	non-section 10 – wetland
W-09	38.2205433	-84.8587848	PEM1E	0.16 ac	non-section 10 – wetland
W-10	38.2212006	-84.8614261	PSS1E	2.72 ac	non-section 10 – wetland
W-11	38.2196453	-84.8613995	PEM1E	0.29 ac	non-section 10 – wetland
OW-1	38.2182920	-84.8545489	PUB3H	0.09 ac	non-section 10 – non-wetland
OW-2	38.2189393	-84.8560257	PUB3H	0.17 ac	non-section 10 – non-wetland

Attachment 4

Wetland and Stream Photographs

Site Photos



Wetland 1 (W-01) facing west.



Wetland 2 (W-02) pond margin facing west.



Wetland 3 (W-03) facing west.



Wetland 4 (W-04) facing south.



Wetland 5 (W-05) facing south.



Wetland 6 (W-06) fringe wetland along Penitentiary Branch.



Wetland 7 (W-07) facing south.



Wetland 8 (W-08) pond margin facing west.



Wetland 9 (W-09) facing west.



Wetland 10 (W-10) facing west from eastern most edge.



Wetland 11 (W-11) facing southeast from northwestern edge.

Non-Wetland Areas



Non-wetland area 1 (#1) west of US 127.



Non-wetland area 2 (#2) east of US 127.

Open Water Areas



Open water 1 (OW-1) facing west.



Open water 2 (OW-2) facing south.

Attachment 5

**Cove Spring Stream Aquatic Assessment Report (ETC
2009)**

2009
BASELINE BIOASSESSMENT REPORT
FOR THE COVE SPRING STREAM RESTORATION PROJECT
FRANKLIN COUNTY, KENTUCKY



Prepared for:

Biohabitats
Louisville, KY
Kentucky Transportation Cabinet
Frankfort, KY

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April 27, 2009

2009
BASELINE AQUATIC BIOASSESSMENT REPORT
FOR THE COVE SPRING STREAM RESTORATION PROJECT
FRANKLIN COUNTY, KENTUCKY

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1. INTRODUCTION

Eco-Tech Consultants (ETC) was contracted by Biohabitats to conduct a baseline bioassessment of the benthic macroinvertebrate and fish communities prior to restoration activities for the Cove Spring stream restoration project, Franklin County, Kentucky. Baseline data presented in this report will be compared with future biomonitoring events in order to determine the success of stream habitat improvements.

Biomonitoring is the systematic use of biological responses from living organisms to evaluate changes in the environment which are often due to anthropogenic sources. Biomonitoring is frequently used in water quality and environmental or biological assessments. It is based upon the idea that organisms have specific habitat requirements, and that the presence, absence, and/or abundance of a certain taxa or taxonomic communities indicate current environmental conditions. Interest in aquatic bioassessment and biomonitoring increased substantially in the United States throughout the 1980s, as the focus of water quality regulation began to shift from point sources to non-point sources of pollution. Recognizing that chemical analyses were often inappropriate to evaluate the biological integrity goal of the Clean Water Act (CWA), the U.S. Environmental Protection Agency (EPA) developed and promoted *Rapid Bioassessment Protocols (RBP) for Use in Streams and Wadeable Rivers* (Plafkin et al. 1989). The purpose of the RBP was to provide a standard methodology to assess the biological condition of water bodies using aquatic organisms.

Bioassessment data in the United States is most frequently analyzed using the multimetric approach. Metrics provide information on biological attributes and, when fully integrated, function as an overall indicator of biological condition (Barbour et al. 1999). Karr (1981) developed the first Index of Biological Integrity (IBI), using metrics derived for fish communities. This general IBI approach, used to develop numerous multimetric indices throughout the world, is designed to maximize detection of degradation by controlling for natural variation (Karr and Chu 1999).

The water quality-based approach to pollution assessment requires various types of data. Biosurvey techniques, such as the RBPs, are best used for detecting aquatic life impairments and assessing their relative severity (Barbour et al. 1999). Integrating information from multiple biological groups as well as from habitat assessments, hydrological investigations, and knowledge of land use is helpful to provide a comprehensive diagnostic assessment of impacts to water quality, habitat structure, energy source, flow regime, and biotic interaction factors (Karr et al. 1986, Karr 1991, Gibson et al. 1996). Some of the advantages of using biosurveys for this type of monitoring are (from Barbour et al. 1999):

- Biological communities reflect overall ecological integrity (i.e., chemical, physical, and biological integrity). Therefore, biosurvey results directly assess the status of a waterbody relative to the primary goal of the Clean Water Act.
- Biological communities integrate the effects of different stressors and thus provide a broad measure of their aggregate impact.
- Communities integrate the stresses over time and provide an ecological measure of fluctuating environmental conditions.
- Routine monitoring of biological communities can be relatively inexpensive, particularly when compared to the cost of assessing toxic pollutants, either chemically or with toxicity tests.

- The status of biological communities is of direct interest to the public as a measure of a pollution free environment.
- Where criteria for specific ambient impacts do not exist (e.g., nonpoint-source impacts that degrade habitat), biological communities may be the only practical means of assessment of stream condition.

Assessment of biological condition is the most effective means of evaluating cumulative impacts from nonpoint sources, which may involve habitat degradation, chemical contamination, or water withdrawal (Karr 1991). Biological assessment techniques can improve evaluations of nonpoint source pollution controls (or the combined effectiveness of current point and nonpoint source controls) by comparing biological indicators before and after implementation of controls. Likewise, biological attributes can be used to measure site-specific ecosystem response to remediation or mitigation activities aimed at reducing nonpoint source pollution impacts or response to pollution prevention activities (Barbour et al. 1999).

Using bioassessment protocols developed by the scientific community, adopted by the U.S. EPA, and modified for use in Kentucky, the purpose of our study was to assess the current aquatic ecological condition for the Cove Spring stream restoration project. The aquatic bioassessment data collected in this report will be considered normal baseline conditions, against which future biomonitoring events (post stream habitat improvement) will be measured.

2. SITE DESCRIPTION

The Cove Spring stream restoration project is located approximately two miles north of the town of Frankfort on the Frankfort East, USGS 7.5-Minute topographic quadrangle map in Franklin County, Kentucky (See Project Location Map). The approximately 100-acre park is located on both sides of US 127 at its intersection with US 421 within Frankfort city limits. This stream restoration project falls within the watershed of the Kentucky River, below Frankfort (HUC 05100205250). In general, streams within the project flow in a west to southwesterly direction. The furthest downstream sample location has a watershed size of 8.75 km² (3.38 mi²) (Hydrology of Kentucky GIS), with feeder streams consisting of intermittent and ephemeral channels.

The Cove Spring stream restoration project area also falls within the U.S. Environmental Protection Agency (EPA) Hills of the Bluegrass Sub-Ecoregion of the Interior Plateau Ecoregion (Woods et al. 2002). According to Woods et al. (2002) the mostly forested Hills of the Bluegrass are underlain by Upper Ordovician calcareous shale, siltstone, and limestone. The physical characteristics of its rock formations are unlike the three surrounding ecoregions. Its upland soils are fairly high in phosphorus, potassium, and lime but are not as naturally fertile as soils found in the Outer Bluegrass and Inner Bluegrass which support young, mixed forests rich in white oak, hickory, and cedar (Woods et al. 2002). The Hills of the Bluegrass has steeper terrain, soils more prone to drought, lower soil fertility, higher drainage density, and more erodible soils than the Outer Bluegrass and Inner Bluegrass regions (Woods et al. 2002). As a result, less than ten percent of this ecoregion is suited to row crop agriculture and the rest is wooded, pastureland, or hayland. Stream nutrient levels within the Hills of the Bluegrass are generally lower than in the Outer Bluegrass, and Inner Bluegrass (Woods et al. 2002). Its upland streams are often intermittent with cobble, boulder, or bedrock substrates and gradients are steeper than in the Inner Bluegrass (Woods et al. 2002). In addition, fish and macroinvertebrate communities are similar to the Outer Bluegrass and Inner Bluegrass but also have elements that are distinct from Knobs–Norman Upland (Woods et al. 2002).

AS1

Aquatic Sample Site 1 (AS-1) is located east of Cove Springs Park, upstream along Penitentiary Branch. At the time of study, weather conditions were sunny and clear. Temperature was approximately 70°F. During the previous 24 hours, there was no substantial rainfall. The surrounding landscape use is upland forest with some residential and industrial buildings along the ridge tops. The riparian zone was dominated by trees, shrubs, and forb species, (box elder [*Acer negundo*], green ash [*Fraxinus pennsylvanica*], spicebush [*Lindera benzoin*] and dogwood species [*Cornus* spp.]). The stream channel was approximately 3 meters wide and ranged from 1 to 18 inches in depth. The sample reach length was approximately 100 m in length with the substrate dominated by cobble and gravel in the riffles and sand/silt in the pools.

AS2

AS-2 is located east of the main entrance to Cove Springs Park, upstream along Penitentiary Branch. At the time of study, weather conditions were sunny and clear. Temperature was approximately 80°F. During the previous 24 hours, there was no substantial rainfall. The surrounding landscape use is residential with some industrial. The riparian zone is comprised of upland forest on the right bank and open field on the left bank. Dominate tree and shrub species present are box elder, American sycamore (*Platanus occidentalis*), spicebush, and wild hydrangea (*Hydrangea arborescens*). The stream channel ranges 3-5 meters wide and 0 to 2 inches in depth. The reach length was approximately 100 m and possessed some evidence of channelization. The streambed at this site is dominated by cobble/bedrock in the riffles and sand/silt in all other habitats.

AS3

AS-3 is located west of the main entrance to Cove Springs Park, just below where Penitentiary Branch flows under US 127. At the time of study, weather conditions were sunny and clear. Temperature was 82°F. During the previous 24 hours, there was no substantial rainfall. The surrounding landscape use is dominated by industry with some forested upland. The riparian zone was dominated by grasses and herbs, with a minor tree/shrub (*Fraxinus pennsylvanica*, *Platanus occidentalis*, and *Cephalanthus occidentalis*) component. The stream channel was 3-5 meters wide and ranged from 2 to 18 inches in depth. The reach length was approximately 100 m and possessed evidence of past channelization. The streams substrate was dominated by gravel in the riffles and gravel/silt in all other habitats.

AS4

AS-4 is located west of the main entrance to Cove Springs Park, just upstream from the flood control levee. At the time of study, weather conditions were sunny and clear. Temperature was 83°F. During the previous 24 hours, there was no substantial rainfall. The surrounding landscape use was industrial with some forested upland. The riparian zone was dominated by trees/shrubs (*Fraxinus pennsylvanica*, *Platanus occidentalis*, and *Cornus* spp) with a grass/herb component. The stream channel was 3-5 m wide and ranged from 2 to 18 inches in depth. The reach length was approximately 100 m and possessed some evidence of past channelization. Streambed substrate was dominated by gravel/cobble in the riffles and gravel/silt in all other habitats.

3. METHODOLOGY

For this report, ETC was retained to collect and identify macroinvertebrates and fish in order to calculate bioassessment metrics and establish baseline conditions prior to restoration activities for future biomonitoring. Aquatic sampling was conducted at three sites in June 2008 and one additional site in April 2009 for fishes and benthic macroinvertebrates. The different sample dates were due to drought conditions which existed in 2008.

3.1. Fishes

Fish sampling was conducted at four aquatic sample sites (AS1-4) to aid in the assessment of the overall aquatic health of the Cove Spring stream restoration project area. Advantages of using fish as biological indicators include their widespread distribution, their utilization of a variety of trophic levels, their stable populations during summer months, and the availability of extensive life history information (Karr et al. 1986). Additionally, fish are good indicators of long-term effects and broad habitat conditions because they are relatively long-lived and mobile (Karr et al. 1986). Fish are also relatively easy to collect and identify to the species level in the field by experienced professionals (Barbour et al. 1999). Fish sampling followed the protocol as defined in *Methods for Assessing Biological Integrity of Surface Waters in Kentucky* (KDOW 2002). Each sample reach length was 100-200 meters. When present, all riffles, runs, and pools, including habitat features such as over hanging banks, large boulders, rootwads, and downed trees, were targeted.

KDOW (2002) sampling protocol for fish in headwater streams required using electrofishing (generator or battery powered) techniques to adequately reach all available habitats. A Smith-Root Model 15 battery-powered backpack electrofisher (Smith-Root Inc., Vancouver, Washington) was used for approximately 600 “shocking seconds” of effort at each site. Specimens not identified in the field were preserved in 10% buffered formalin solution and returned to the lab for identification. Etnier and Starnes’ *Fishes of Tennessee* (1993) was employed as the primary taxonomic reference for identification.

3.2. Benthic Macroinvertebrates

Benthic macroinvertebrate sampling was also conducted to aid in assessment of the overall aquatic health of the Cove Spring stream restoration project area. Advantages of using benthic macroinvertebrates as biological indicators include: they are good indicators of localized conditions because many have limited migration patterns or a sessile mode of life; they are made up of species that constitute a broad range of trophic levels and pollution tolerances, thus providing strong information for interpreting cumulative effects; they are relatively easy to collect; they integrate the effects of short-term environmental variations because most have complex life cycles with sensitive life stages responding quickly to stressors while the overall community responds more slowly; and an experienced biologist can detect degraded conditions with only a cursory examination of the benthic assemblages (Barbour et al. 1999). Sampling followed the protocol as defined in *Methods for Assessing Biological Integrity of Surface Waters in Kentucky* (KDOW 2002).

Two sampling techniques semi-quantitative (riffle) and qualitative (multi-habitat) were employed at each of the four aquatic sample sites to assess the aquatic macroinvertebrate community. Riffles were sampled using a 600 μ m mesh, one meter wide kick net placed at representative locations across the stream. Four 0.25 m² samples were taken from mid-riffle or the thalweg,

dislodging benthos by vigorously disturbing 0.25 m² in front of the net. Large rocks were hand-washed and combined with the net samples. The contents of the nets were then washed, and all four samples were sieved to remove detritus and other particles.

Multi-habitat sampling involved collecting macroinvertebrates from a variety of non-riffle habitats using 800 X 900 µm mesh triangular or d-frame dipnets. If available, each of the following habitats was sampled in at least 3 replicates:

- 1) Sweep sample
 - undercut banks/root mats
 - marginal emergent vegetation
 - bedrock or slab-rock habitats
 - water willow (*Justicia americana*) beds
 - leaf packs
- 2) Silt, sand, and fine gravel
- 3) Aufwuchs sample (small amount of rocks sticks and leaves)
- 4) Rock picking (15 cobble/boulder sized rocks)
- 5) Wood sample (2-6 inches diameter and 10 to 20 linear feet)

Collections from riffle and multi-habitat samples were kept separate and preserved in 95% ethanol, for later laboratory identification at ETC lab in the Frankfort office. Macroinvertebrates were sorted and identified to the lowest practicable taxonomic level, usually genera. Identifications were made using Merritt et Al. 2008, Merritt and Cummins *Aquatic Insects of North America* (1996) and Thorp and Covich's *Ecology and Classification of North American Freshwater Invertebrates* (2001). Individuals from the family Chironomidae and class Oligochaeta were not identified beyond these taxonomic levels. Once quantified, specimens were labeled and preserved for voucher cataloguing.

3.3. Data Analysis

Fish species occurrence was tabulated for the sample sites and selected core metrics obtained from KDOW's manual *Development and Application of the Index of Biotic Integrity* (Compton et al. 2003). These core metrics were then calculated to aid in the determination of stream conditions.

The following metrics are those identified as being sensitive to changes in aquatic environment and are based on reference data collected by KDOW:

Species Richness and Composition

- 1) Richness of native fish species (NAT)
- 2) Richness of darter, madtom, and sculpin species (DMS)
- 3) Richness of intolerant species (INT)

Trophic Composition

- 1) Proportion of individuals as insectivores (%INST)

Fish Abundance and Condition

- 1) Proportion of tolerant individuals (%TOL)
- 2) Richness of simple lithophilic spawning species (SL)
- 3) Number of headwater spawning species (%FHW)

The metrics above were used to calculate a Kentucky Index of Biotic Integrity (KIBI) for each sample site. KIBI scores were weighted according to ecoregion and assigned a descriptor (Excellent, Good, Fair, Poor, Very Poor).

Similar to fish, a benthic macroinvertebrate species occurrence table was created and KDOW's *The Kentucky Macroinvertebrate Bioassessment Index* (KMBI; Pond et al. 2003) was consulted for 7 core metrics and calculations to aid in the determination stream quality.

The following metrics are those identified as being sensitive to changes in aquatic environment and are based on reference data collected from representative ecoregions across Kentucky:

- 1) Taxa richness (TR)
- 2) Ephemeroptera, Plecoptera, Trichoptera richness (EPT)
- 3) Modified Hilsenhoff Biotic Index (mHBI)
- 4) Modified percent EPT abundance (m%EPT)
- 5) Percent Ephemeroptera (%Ephem)
- 6) Percent Chironomidae and Oligochetes (%Chir&Olig)
- 7) Percent Clingers (%Cling)

These core metrics were compared to reference data and KMBIs were calculated (Pond et al. 2003) for each site. Similar to the KIBI, once KMBI values were then rated based on the criteria for assigning narrative rating for headwater streams within the Bluegrass bioregion of Kentucky and assigned a descriptor (Excellent, Good, Fair, Poor, Very Poor). This rating is used to assess the site's overall water quality, habitat diversity, and/or habitat suitability.

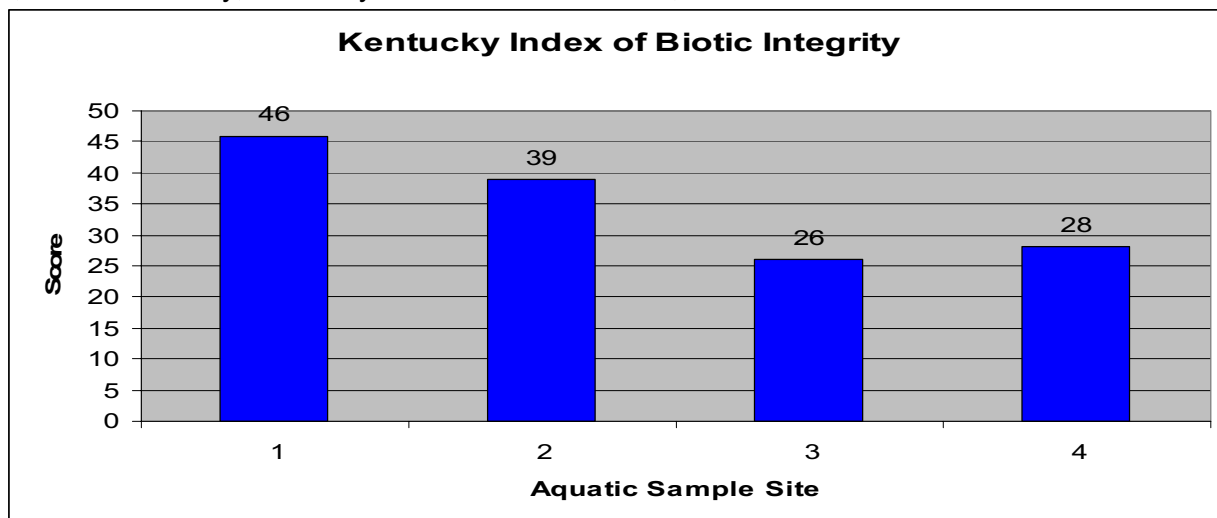
4. RESULTS AND DISCUSSION

4.1. Fishes

ETC ecologists sampled the fish communities at four sample sites (AS-1-4) along the main stem of Penitentiary Branch within the Cove Spring Stream Restoration Area. Sample results and calculated KIBI values for fish are found in Appendix A-Table 1 and summarized in Figure 1. A total of 109 fish representing 6 families and 12 species were collected during electroshocking and seining at these sites. Cyprinidae, Centrarchidae, and Percidae were the dominate families, being represented by the most species (n=3) and the highest number of individuals (n=21, n=13, n=51 respectively).

Orangethroat darters (*Etheostoma spectabile*; n=29) were the most numerous species captured, followed by fantail darters (*Etheostoma flabellare*; n=15) and creek chubs (*Semotilus atromaculatus*; n=11). Overall, these fish were more abundant than any other fish species captured. Other species collected include green sunfish (*Lepomis cyanellus*), banded sculpin (*Cottus carolinae*), bluntnose minnow (*Pimphales notatus*), rainbow darter (*Etheostoma caeruleum*), western mosquitofish (*Gambusia affinis*), bluegill (*Lepomis macrochirus*), longear sunfish (*Lepomis megalotis*), and central stoneroller (*Camptostoma anomalum*).

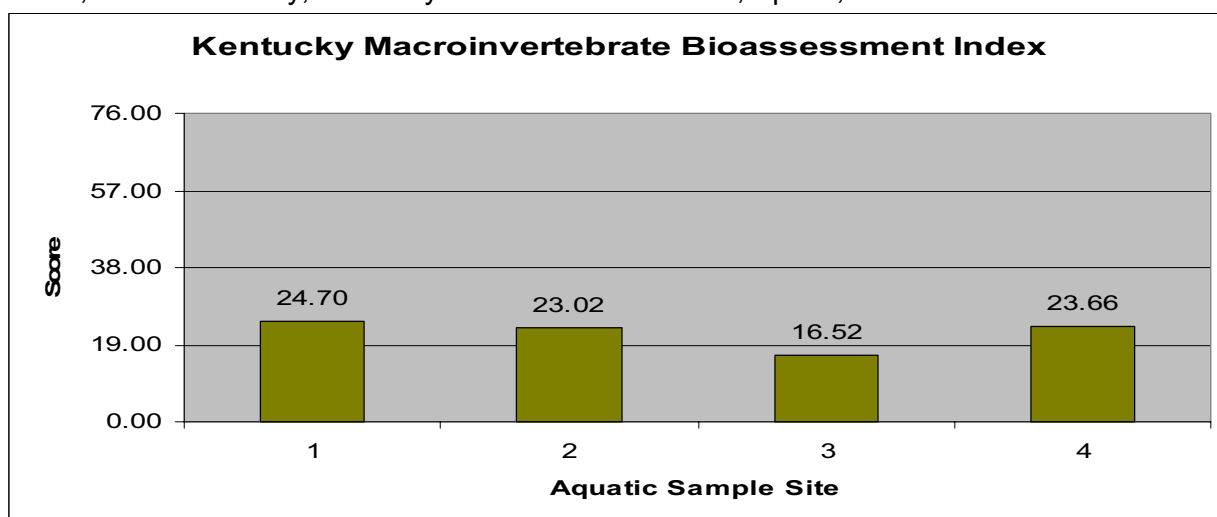
Figure 1. KIBI values for the Cove Spring stream restoration project aquatic sample sites AS1-4, Franklin County, Kentucky. Data collected June 4, 2008



4.2. Benthic Macroinvertebrates

ETC ecologists sampled the macroinvertebrate communities at four sample sites (AS-1-4) along the main stem of Penitentiary Branch within the Cove Spring stream restoration area. Sample results and calculated KMBI values for macroinvertebrates are found in Appendix A-Table 2 and summarized in Figure 2. A total of 798 macroinvertebrates representing 22 families and 23 taxa were collected and identified from both the semi-quantitative (riffle) and qualitative (multi-habitat) samples. Taxa richness (genus level) was similar among the four sites, ranging from 10 (AS-1&2) to 16 (AS-4). AS-1 contained the highest number of individuals collected (262 total), approximately 65% of which was comprised of four generally pollution tolerant groups (Crangonyctidae, Oligochaeta, Chironomidae, Asellidae). Isopods were, by far, the most commonly encountered invertebrate from all sites. Three sites scored in the “poor” category for calculated KMBIs, and one scored “very poor”. AS-3 had the lowest KMBI score (16.52), and AS-1 had the highest at 24.7.

Figure 2. KMBI values for the Cove Spring stream restoration project aquatic sample sites AS1-4, Franklin County, Kentucky. Data collected June 4, April 2, 2008.



The KMBI score is heavily weighted towards quality and taxonomic variability of the quantitative riffle sample. Riffle organisms from the orders Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies) also receive special attention as they have shown to be sensitive to a variety environmental cues. For Penitentiary Branch, all riffle organisms, with the exception of Isopods, continue to be depauperate. Several factors, such as elevated sedimentation, poor substrate sorting, low dissolved oxygen, and chemical contaminants, may contribute to the observed results. However, significant development of riffle invertebrate assemblages should not be expected here even under ideal circumstances, because much of the stream bed goes dry in the warmer months. This restricts the success of organisms that require multiple years (semivoltine) to complete their larval life stages. Isopods thrive, however, because they have the ability to follow receding water levels below the substrate to groundwater reservoirs and fulfill their biological demands.

5. SUMMARY

The Baseline Aquatic Bioassessment of Penitentiary Branch, as part of the Cove Spring Restoration Project, indicates "Poor" overall water quality within Penitentiary Branch. Fish and macroinvertebrate community assemblages, when compared to other Interior Plateau Bluegrass Bioregion reference sites with similar watershed size, scored "Fair" to "Poor". For fish, two of the three sample sites (AS-3, AS-4) scored in the "Poor" category for this Ichthyoregion while the other two (AS-1, AS-2) scored "Fair". For macroinvertebrates, three of the four sample sites (AS-1, AS-2, AS-4) scored in the "Poor" category while one (AS-3) scored very poor. These low KIBI and KMBI scores suggest a loss of biological integrity within the fish and macroinvertebrate communities located within the park. Overall ratings of poor mean that Penitentiary Branch lacks good water quality which is needed to support a diverse and healthy aquatic fauna. This reduction in water quality may be attributed to many factors such as riparian vegetation loss, pollution, stream channelization, increased storm water runoff urbanization, and an unstable substrate/habitat.

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Appendix A - Aquatic Sample Data Tables

Table 1. Kentucky Index of Biotic Integrity (KIBI)

Table 2. Kentucky Macroinvertebrate Bioassessment Index (KMBI)

Table 1. Kentucky Index of Biotic Integrity (KIBI) raw values and metric scores (KDOW 2002) for aquatic sample sites 1-4, Cove Spring Stream Restoration Project, Franklin County, Kentucky. Data collected June 4, 2008, April 2, 2009.

Family	Genus	Species	Common Name	Site 1	Site 2	Site 3	Site 4	TOTAL	fish type	native	INS	INT	TOL	SL	FHW
Poeciliidae	<i>Gambusia</i>	<i>affinis</i>	Western mosquitofish	0	0	5	0	5		X	X		X		X
Cyprinidae	<i>Semotilus</i>	<i>atromaculatus</i>	Creek chub	0	9	2	0	11	MIN	X			X		
Cyprinidae	<i>Pimephales</i>	<i>notatus</i>	Bluntnose minnow	0	0	6	3	9	MIN	X			X		X
Cyprinidae	<i>Campostoma</i>	<i>anomalum</i>	Central stoneroller	0	0	1	0	1	MIN	X					X
Catostomidae	<i>Catostomous</i>	<i>commersoni</i>	White sucker	0	3	0	0	3	SUC	X			X	X	X
Centrarchidae	<i>Lepomis</i>	<i>cyanellus</i>	Green sunfish	0	0	5	5	10	SUN	X	X		X		X
Centrarchidae	<i>Lepomis</i>	<i>megalotis</i>	Longear sunfish	0	0	1	0	1	SUN	X		X			X
Centrarchidae	<i>Lepomis</i>	<i>macrochirus</i>	Bluegill	0	0	0	3	3	SUN	X	X		X		X
Cottidae	<i>Cottus</i>	<i>carolinae</i>	Banded sculpin	5	0	3	7	10	COT	X	X		X		
Percidae	<i>Etheostoma</i>	<i>spectabile</i>	Orangethroat darter	0	5	19	5	29	DAR	X	X			X	
Percidae	<i>Etheostoma</i>	<i>caeruleum</i>	Rainbow darter	0	0	0	7	7	DAR	X	X			X	
Percidae	<i>Etheostoma</i>	<i>flabellare</i>	Fantail darter	0	0	0	15	15	DAR	X	X				

		Total Individuals	5	17	42	45	109
		Taxa Richness	1	3	8	7	13
KIBI Rating	Bluegrass	NAT	1	3	8	7	
		DMS	1	1	2	4	
Excellent	>52	INT	0	0	1	0	
		SL	0	2	1	2	
Good	47-51	%INSCT	100	0.29	0.76	0.93	
		%TOL	100	0.71	0.50	0.40	
Fair	31-46	%FHW	0	0.18	0.43	0.24	
		KIBI	46	39	26	28	
Poor	16-30	Rating	Fair	Fair	Poor	Poor	
Very poor	0-15						

TNI	Total individuals	%INSCT	Proportion of insectivorous species
TR	Taxa richness	%TOL	Proportion of tolerant individuals
NAT	Native species richness	%FHW	Number of headwater species
DMS	Darter, madtom, sculpin richness		
INT	Intolerant species richness		
SL	Simple lithophilic spawning species richness		

Table 2. Kentucky Macroinvertebrate Bioassessment Index (KMBI) raw values and metric scores (KDOW 2002) for aquatic sample sites 1-4, Cove Spring Stream Restoration project, Franklin County, Kentucky. Data collected June 4, 2008 and April 2, 2009.

Order	Family	Genus	Species	Sample Sites				TV	Cling
				1	2	3	4		
Tricladida	Planariidae	Unid. Planariid	sp.	12	2	5	1	7.00	
Annelida		Unid. Oligochaeta	sp.	4	1	25	4	8.20	
Lymnophila	Planorbidae	Helisoma	sp.		X	2	X	6.20	
	Lymnaeidae	Lymnaea	sp.			4	1	7.00	
Basommatophora	Physidae	Physella	sp.			14	1	8.84	
Heterodonta	Sphaeriidae	Unid. Sphaeriid	sp.			X	X		
Ephemeroptera	Baetidae	Baetis	sp.	1			5	5.40	
Plecoptera	Perlidae	Perlesta	sp.		1			4.70	Yes
Hemiptera	Gerridae	Trepobates	sp.		X				
	Corixidae	Palmacorixa	sp.			X	X		
Trichoptera	Hydropsychidae	Cheumatopsyche	sp.				2	6.22	Yes
	Hydroptilidae	Ochrotrichia	sp.		X				
	Rhyacophilidae	Rhyacophila	sp.	4			X		Yes
Coleoptera	Psephenidae	Ectopria	sp.		1			4.16	Yes
	Hydrophilidae	Berous	sp.				X		
Diptera	Chironomidae	Unid. Chironomid	sp.	16	1	49	27	7.00	
	Simuliidae	Simulium	sp.	8		3	3	4.40	Yes
Decapoda	Cambaridae	Unid. Cambarid	sp.		X	5	14	6.00	
	Cambaridae	Cambarus	sp.			X			
	Cambaridae	Cambarus	tenebrosus	2					
Amphipoda	Gammaridae	Gammarus	sp.			35	6	8.00	
	Crangonyctidae	Crangonyx	sp.	6					
Isopoda	Asellidae	Lirceus	fontinalis	73	135	32	25	7.85	

"X" indicates qualitative occurrence only

Headwater <5 sq. mi.

Rating	BG
Excellent	> 63
Good	56-62
Fair	37-55
Poor	19--36
Very Poor	0-18




G-TR	10	10	13	16
G-EPT	2	2	0	3
mHBI	6.49	7.32	7.58	7.00
m%EPT	3.94	0.70	0.00	5.62
%Eph	0.79	0.00	0.00	5.62
% Chir + %Olig	15.75	1.40	42.50	34.80
%Cling	9.45	1.40	1.72	5.62
TNI	262	181	216	139
MBI*	24.7	23.02	16.52	23.66
Rating	Poor	Poor	Very Poor	Poor

* Calculated using KDOW percentile equation spreadsheet

Appendix B - Maps and Drawings


Aquatic Sample Sites



-  Sampling Reach
-  Perennial Stream(p)
-  Intermittent Stream(i)

Aquatic Sample Sites
Baseline Aquatic Bioassessment Report
for the Cove Springs Stream Restoration Project,
Franklin County, Kentucky
FSA 2004 NAIP DOQQ



 Perennial Stream(p)
 Sampling Reach

Aquatic Sample Sites
Baseline Aquatic Bioassessment Report
for the Cove Springs Stream Restoration Project,
Franklin County, Kentucky
FSA 2004 NAIP DOQQ


931 E. Main St.
Frankfort, KY 40601
502-695-8060

Appendix C - Photographs

AS-1, Penitentiary Branch

AS-2, Penitentiary Branch

AS-3, Penitentiary Branch

AS-4, Penitentiary Branch



AS-1: Looking upstream (east; 2009)



AS-1: Looking downstream (west; 2009)



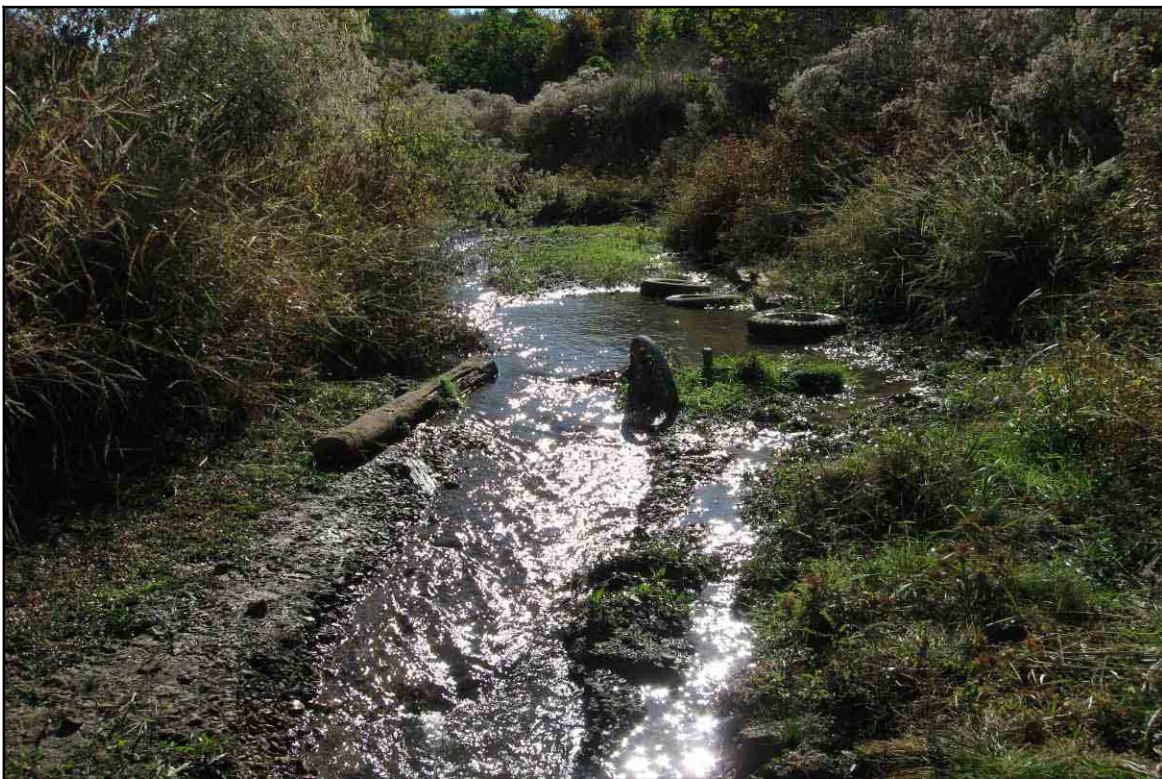
AS-2: Looking upstream (east; 2008)



AS-2: Looking downstream (west; 2009)



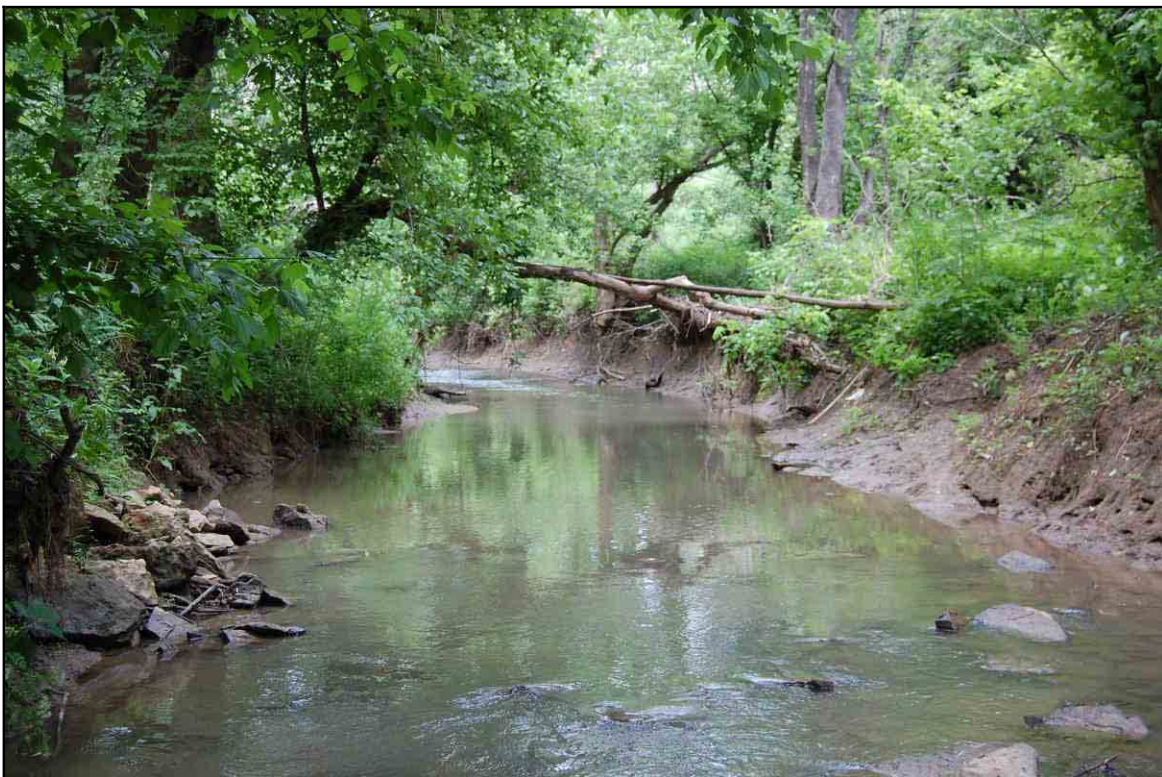
AS-3: Looking downstream (west; 2008).



AS-3: Looking upstream (east; 2008).



AS-4: Looking downstream (west; 2008).



AS-4: Looking upstream (east; 2008).

Attachment 6

**U.S. Army Corps of Engineers 1987 Routine Wetland
Determination Forms**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Cove Spring Restoration</u>		Date: <u>October 9, 2008</u>
Applicant/Owner: <u>Kentucky Transportation Cabinet</u>		County: <u>Franklin</u>
Investigator: <u>Robert Oney, Shane Roberts</u>		State: <u>Kentucky</u>
Do normal circumstances exist on the site?	Yes No	Community ID: _____
Is the site significantly disturbed (Atypical Situation)?	Yes No	Transect ID: _____
Is the area a potential problem area?	Yes No	Plot ID: <u>NON Wetland 1</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Juniperus virginiana</u>	<u>T/S</u>	<u>FACU</u>	9. <u>Ageratina altissima</u>	<u>H</u>	<u>FACU-</u>
2. <u>Platanus occidentalis</u>	<u>T/S</u>	<u>FACW</u>	10. <u>Alliaria petiolata</u>	<u>H</u>	<u>FACU-</u>
3. <u>Ulmus rubra</u>	<u>T/S</u>	<u>FAC</u>	11. <u>Acer negundo</u>	<u>T/S</u>	<u>FAC+</u>
4. <u>Fraxinus pennsylvanica</u>	<u>T/S</u>	<u>FACW</u>	12. <u>Celtis occidentalis</u>	<u>T/S</u>	<u>FACU</u>
5. <u>Verbesina alternifolia</u>	<u>H</u>	<u>FAC</u>	13. <u>Populus deltoides</u>	<u>T</u>	<u>FAC</u>
6. <u>Lonicera japonica</u>	<u>HV</u>	<u>NI</u>	14. <u>Juglans nigra</u>	<u>T</u>	<u>FACU</u>
7. <u>Lonicera maackii</u>	<u>S</u>	<u>NI</u>	15. <u>Apocynum cannabinum</u>	<u>H</u>	<u>FACU</u>
8. <u>Fescue spp.</u>	<u>H</u>	<u>NI</u>	16. <u>Prunus serotina</u>	<u>T</u>	<u>FACU</u>

Percent of Dominant Species that are OBL, FACW, or FAC 6/15 =40%, FAC Neutral Test 2:7
(excluding FAC-).

REMARKS: Plant community is not dominated by hydrophytic vegetation, and did not pass the FAC Neutral test.

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in remarks): _____ Stream, Lake or Tide Gauge <input checked="" type="checkbox"/> Aerial Photos <input type="checkbox"/> Other <input type="checkbox"/> No Recorded Data Available	
Field Observations: Depth of Surface Water: <u>NA</u> Depth to Free Water in Pit: <u>NA</u> Depth to Saturated Soil: <u>NA</u>	
Wetland Hydrology Indicators: Primary Indicators: <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands	Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)

REMARKS: Indicators of hydrology were not observed at time of field investigation.

SOILS

Map Unit Name (Series and Phase): _____		Drainage Class: _____													
Taxonomy: _____		Field Observations Confirm Map Type? Yes No													
Profile Description: <table style="width: 100%;"> <tr> <td style="width: 15%;">Depth (inches)</td> <td style="width: 15%;">Horizon</td> <td style="width: 15%;">Matrix Color (Munsell Moist)</td> <td style="width: 15%;">Mottle Colors (Munsell Moist)</td> <td style="width: 15%;">Mottle Abundance/Contrast</td> <td style="width: 20%;">Texture, Concretions, Structure, etc</td> </tr> <tr> <td>0-16</td> <td></td> <td>10YR 3/2</td> <td></td> <td></td> <td>Silt Loam</td> </tr> </table>				Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc	0-16		10YR 3/2			Silt Loam
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc										
0-16		10YR 3/2			Silt Loam										
Hydric Soil Indicators: <input type="checkbox"/> Histosol <input type="checkbox"/> Histic Epipedon <input type="checkbox"/> Sulfidic Odor <input type="checkbox"/> Aquic Moisture Regime <input type="checkbox"/> Concretions <input type="checkbox"/> Reducing Conditions <input type="checkbox"/> Gleyed or Low-Chroma Colors <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soil <input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listed on Local Hydric Soils List <input type="checkbox"/> Listed on National Hydric soils List															

REMARKS: Low chroma soils were observed however mottling was not.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? No	Wetland Hydrology Present? No
Hydric Soils Present? Yes	Is this Sampling Point Within a Wetland? No
IS THIS A WETLAND? NO Signature: _____	
Remarks: This sample plot failed all three requirements for being a jurisdictional wetland.	

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Cove Spring Restoration</u>		Date: <u>October 7, 2008</u>
Applicant/Owner: <u>Kentucky Transportation Cabinet</u>		County: <u>Franklin</u>
Investigator: <u>Shane Roberts, Scott Slankard, Ryan Slack</u>		State: <u>Kentucky</u>
Do normal circumstances exist on the site?	Yes No	Community ID: _____
Is the site significantly disturbed (Atypical Situation)?	Yes No	Transect ID: _____
Is the area a potential problem area?	Yes No	Plot ID: <u>non wetland 2</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u><i>Typha latifolia</i></u>	H	OBL	9. <u><i>Ulmus rubra</i></u>	T/S	FAC
2. <u><i>Lemna minor</i></u>	H	OBL	10. <u><i>Campsis radicans</i></u>	H	FAC
3. <u><i>Cyperus strigosus</i></u>	H	FACW	11. <u><i>Solidago canadensis</i></u>	H	FACU
4. <u><i>Acer negundo</i></u>	T/S	FAC+	12.		
5. <u><i>Symphyotrichum navae-angliae</i></u>	H	FACW-	13.		
6. <u><i>Symphyotrichum racemosum</i></u>	H	FACW	14.		
7. <u><i>Polygonum hydropiperoides</i></u>	H	OBL	15.		
8. <u><i>Ageratina altissima</i></u>	H	FACU-	16.		

Percent of Dominant Species that are OBL, FACW, or FAC 9/11 =81.8%, FAC Neutral Test 6:2 (excluding FAC-).

REMARKS: **Plant community is dominated by hydrophytic vegetation, and passes the FAC Neutral test.**

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in remarks): _____ Stream, Lake or Tide Gauge <input checked="" type="checkbox"/> Aerial Photos <input type="checkbox"/> Other <input type="checkbox"/> No Recorded Data Available	
Field Observations: Depth of Surface Water: <u>12 inches</u> Depth to Free Water in Pit: <u>NA</u> Depth to Saturated Soil: <u>NA</u> Wetland Hydrology Indicators: Primary Indicators: <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <input checked="" type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands </div> <div style="width: 45%;"> Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-stained Leaves <input type="checkbox"/> Local Soil Survey Data <input checked="" type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks) </div> </div>	

REMARKS: **Hydrology present, however it is man induced.**

SOILS

Map Unit Name (Series and Phase): _____		Drainage Class: _____													
Taxonomy: _____		Field Observations Confirm Map Type? Yes No													
Profile Description: <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Depth (inches)</th> <th>Horizon</th> <th>Matrix Color (Munsell Moist)</th> <th>Mottle Colors (Munsell Moist)</th> <th>Mottle Abundance/Contrast</th> <th>Texture, Concretions, Structure, etc</th> </tr> </thead> <tbody> <tr> <td><u>NA</u></td> <td></td> <td></td> <td></td> <td></td> <td><u>NA</u></td> </tr> </tbody> </table>				Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc	<u>NA</u>					<u>NA</u>
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc										
<u>NA</u>					<u>NA</u>										
Hydric Soil Indicators: <input type="checkbox"/> Histosol <input type="checkbox"/> Histic Epipedon <input type="checkbox"/> Sulfidic Odor <input type="checkbox"/> Aquic Moisture Regime <input type="checkbox"/> Concretions <input type="checkbox"/> Reducing Conditions <input type="checkbox"/> Gleyed or Low-Chroma Colors <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soil <input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listed on Local Hydric Soils List <input type="checkbox"/> Listed on National Hydric soils List															

REMARKS: **Hydric soils are absent; substrate is concrete covered by thin layer of decomposing organic material.**

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes	Wetland Hydrology Present? Yes
Hydric Soils Present? No	Is this Sampling Point Within a Wetland? No
IS THIS A WETLAND? NO Signature: _____	
Remarks: This area is an atypical situation, hydrophytic vegetation is being maintained only because of man-induced wetland hydrology and hydric soils are absent.	

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Cove Spring Restoration</u>		Date: <u>October 9, 2008</u>
Applicant/Owner: <u>Kentucky Transportation Cabinet</u>		County: <u>Franklin</u>
Investigator: <u>Robert Oney, Shane Roberts</u>		State: <u>Kentucky</u>
Do normal circumstances exist on the site?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Community ID: _____
Is the site significantly disturbed (Atypical Situation)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Transect ID: _____
Is the area a potential problem area?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Plot ID: <u>Wetland 1 (W-01)</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <i>Typha latifolia</i>	H	OBL	9. <i>Impatiens capensis</i>	H	FACW
2. <i>Eupatorium perfoliatum</i>	H	FACW	10. <i>Salix nigra</i>	H	FACW+
3. <i>Lemna minor</i>	H	OBL	11. <i>Ambrosia artemisiifolia</i>	H	FACU
4. <i>Cyperus strigosus</i>	H	FACW	12. <i>Xanthium strumarium</i>	H	FAC
5. <i>Cephalanthus occidentalis</i>	S	OBL	13. <i>Symphytotrichum racemosum</i>	H	OBL
6. <i>Bidens frondosa</i>	H	FACW	14. <i>Conoclinium coelestinum</i>	H	FAC
7. <i>Bidens cernua</i>	H	OBL	15. <i>Salix nigra</i>	S	FACW+
8. <i>Juncus effusus</i>	H	FACW+	16. <i>Ageratina altissima</i>	H	FACU-
			17. <i>Agrimonia parviflora</i>	H	FAC

Percent of Dominant Species that are OBL, FACW, or FAC 14/17 = 82.4%, FAC Neutral Test 10:3 (excluding FAC-).

REMARKS: **Plant community dominated by hydrophytic vegetation, and passes the FAC Neutral test.**

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in remarks): _____ Stream, Lake or Tide Gauge <input checked="" type="checkbox"/> Aerial Photos <input type="checkbox"/> Other <input type="checkbox"/> No Recorded Data Available	
Field Observations: Depth of Surface Water: <u>0-2 inches</u> Depth to Free Water in Pit: <u>6 inches</u> Depth to Saturated Soil: <u>3 inches</u>	
Wetland Hydrology Indicators: Primary Indicators: <input checked="" type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input checked="" type="checkbox"/> Drainage Patterns in Wetlands	Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-stained Leaves <input type="checkbox"/> Local Soil Survey Data <input checked="" type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)

REMARKS: **Hydrology indicators present.**

SOILS

Map Unit Name (Series and Phase) <u>Lindside silt loam, occasionally flooded</u> Drainage Class: <u>moderately well drained with moderate to slow permeability</u> Taxonomy: <u>Fluviadventic Eutrochrepts</u>					
Field Observations Confirm Map Type? Yes					
Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc
0-16		10YR 4/1	10YR 4/2	Few/Faint	Silty Clay Loam
Hydric Soil Indicators: <input type="checkbox"/> Histosol <input type="checkbox"/> Histic Epipedon <input type="checkbox"/> Sulfidic Odor <input type="checkbox"/> Aquic Moisture Regime <input type="checkbox"/> Concretions <input type="checkbox"/> Reducing Conditions <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soil <input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listed on Local Hydric Soils List <input type="checkbox"/> Listed on National Hydric soils List					

REMARKS: **Hydric soils present**

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes	Wetland Hydrology Present? Yes
Hydric Soils Present? Yes	Is this Sampling Point Within a Wetland? Yes
IS THIS A WETLAND? YES	Signature: _____
Remarks: This is a 1.78 acre PEM1E wetland.	

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Cove Spring Restoration</u>		Date: <u>October 9, 2008</u>
Applicant/Owner: <u>Kentucky Transportation Cabinet</u>		County: <u>Franklin</u>
Investigator: <u>Robert Oney, Shane Roberts</u>		State: <u>Kentucky</u>
Do normal circumstances exist on the site?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Community ID: _____
Is the site significantly disturbed (Atypical Situation)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Transect ID: _____
Is the area a potential problem area?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Plot ID: <u>Wetland 2 (W-02)</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u><i>Typha latifolia</i></u>	<u>H</u>	<u>OBL</u>	9. <u><i>Scirpus atrovirens</i></u>	<u>H</u>	<u>OBL</u>
2. <u><i>Bidens cernua</i></u>	<u>H</u>	<u>OBL</u>	10. <u><i>Lemna minor</i></u>	<u>H</u>	<u>OBL</u>
3. <u><i>Juncus effusus</i></u>	<u>H</u>	<u>FACW+</u>	11. <u><i>Ludwigia peploides</i></u>	<u>H</u>	<u>OBL</u>
4. <u><i>Cyperus strigosus</i></u>	<u>H</u>	<u>FAC</u>	12. <u><i>Echinochloa crus-galli</i></u>	<u>H</u>	<u>FACU</u>
5. <u><i>Hibiscus moscheutos</i></u>	<u>H</u>	<u>OBL</u>	13. _____		
6. <u><i>Carex frankii</i></u>	<u>H</u>	<u>OBL</u>	14. _____		
7. <u><i>Juncus torreyi</i></u>	<u>H</u>	<u>FACW</u>	15. _____		
8. <u><i>Lycopus americanus</i></u>	<u>H</u>	<u>OBL</u>	16. _____		

Percent of Dominant Species that are OBL, FACW, or FAC 11/12=91.6%, FAC Neutral Test 11:1 (excluding FAC-).

REMARKS: **Plant community dominated by hydrophytic vegetation, and passes the FAC Neutral test.**

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in remarks): _____ Stream, Lake or Tide Gauge <input checked="" type="checkbox"/> Aerial Photos <input type="checkbox"/> Other <input type="checkbox"/> No Recorded Data Available	
Field Observations: Depth of Surface Water: <u>0-6 inches</u> Depth to Free Water in Pit: <u>6 inches</u> Depth to Saturated Soil: <u>2 inches</u>	
Wetland Hydrology Indicators: Primary Indicators: <input checked="" type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands	Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-stained Leaves <input type="checkbox"/> Local Soil Survey Data <input checked="" type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
REMARKS: Hydrology indicators present.	

SOILS

Map Unit Name (Series and Phase) <u>Lindside silt loam, occasionally flooded</u> Drainage Class: <u>moderately well drained with moderate to slow permeability</u> Taxonomy: <u>Fluviaduentic Eutrochrepts</u>					
Field Observations Confirm Map Type? <u>Yes</u>					
Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast Common/Distinct	Texture, Concretions, Structure, etc
<u>0-16</u>	_____	<u>10YR 4/1</u>	<u>7.5YR 4/6</u>	_____	_____
Hydric Soil Indicators: <input type="checkbox"/> Histosol <input type="checkbox"/> Histic Epipedon <input type="checkbox"/> Sulfidic Odor <input type="checkbox"/> Aquic Moisture Regime <input type="checkbox"/> Concretions <input type="checkbox"/> Reducing Conditions <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soil <input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listed on Local Hydric Soils List <input type="checkbox"/> Listed on National Hydric soils List					
REMARKS: Hydric soils present.					

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <u>Yes</u>	Wetland Hydrology Present? <u>Yes</u>
Hydric Soils Present? <u>Yes</u>	Is this Sampling Point Within a Wetland? <u>Yes</u>
IS THIS A WETLAND? YES	Signature: _____
Remarks: This is a 0.05 acre PEM1H fringe wetland.	

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Cove Spring Restoration</u>		Date: <u>October 10, 2008</u>
Applicant/Owner: <u>Kentucky Transportation Cabinet</u>		County: <u>Franklin</u>
Investigator: <u>Robert Oney, Scott Slankard, Ryan Slack</u>		State: <u>Kentucky</u>
Do normal circumstances exist on the site?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Community ID: _____
Is the site significantly disturbed (Atypical Situation)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Transect ID: _____
Is the area a potential problem area?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Plot ID: <u>Wetland 10 (W-10)</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Boehmeria cylindrica</u>	<u>H</u>	<u>FACW+</u>	9. <u>Acer negundo</u>	<u>S</u>	<u>FAC+</u>
2. <u>Cephalanthus occidentalis</u>	<u>S</u>	<u>OBL</u>	10. <u>Saururus cernuus</u>	<u>H</u>	<u>OBL</u>
3. <u>Salix nigra</u>	<u>S</u>	<u>FACW+</u>	11. <u>Acorus calamus</u>	<u>H</u>	<u>OBL</u>
4. <u>Fraxinus pennsylvanica</u>	<u>S</u>	<u>FACW</u>	12. _____		
5. <u>Hibiscus moscheutos</u>	<u>H</u>	<u>OBL</u>	13. _____		
6. <u>Rumex crispus</u>	<u>H</u>	<u>FACU</u>	14. _____		
7. <u>Carex frankii</u>	<u>H</u>	<u>OBL</u>	15. _____		
8. <u>Ageratina altissima</u>	<u>H</u>	<u>FACU-</u>	16. _____		

Percent of Dominant Species that are OBL, FACW, or FAC 9/11=81.8%, FAC Neutral Test 8:2
(excluding FAC-).

REMARKS: **Plant community dominated by hydrophytic vegetation, and passes the FAC Neutral test.**

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in remarks): _____ Stream, Lake or Tide Gauge <input checked="" type="checkbox"/> Aerial Photos <input type="checkbox"/> Other <input type="checkbox"/> No Recorded Data Available	
Field Observations: Depth of Surface Water: <u>0-12 inches</u> Depth to Free Water in Pit: <u>4 inches</u> Depth to Saturated Soil: <u>~3 inches</u>	
Wetland Hydrology Indicators: Primary Indicators: <input checked="" type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 inches <input type="checkbox"/> Water Marks <input checked="" type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input checked="" type="checkbox"/> Drainage Patterns in Wetlands	Secondary Indicators (2 or more required): <input checked="" type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-stained Leaves <input type="checkbox"/> Local Soil Survey Data <input checked="" type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)

REMARKS: **Hydrology indicators present.**

SOILS

Map Unit Name (Series and Phase): <u>Newark silt loam, Occasionally Flooded</u> Drainage Class: <u>Poorly drained, moderately permeable soils</u> Taxonomy: <u>Mesic Aeric Fluvaquents</u> Field Observations Confirm Map Type? <u>No</u>					
Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc
<u>0-16</u>		<u>10YR 4/3</u>	<u>10YR 4/6</u>	<u>few/distinct</u>	<u>silt loam</u>
Hydric Soil Indicators: <input type="checkbox"/> Histosol <input type="checkbox"/> Histic Epipedon <input type="checkbox"/> Sulfidic Odor <input type="checkbox"/> Aquic Moisture Regime <input type="checkbox"/> Concretions <input type="checkbox"/> Reducing Conditions <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soil <input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listed on Local Hydric Soils List <input checked="" type="checkbox"/> Listed on National Hydric soils List					
REMARKS: Hydric soils present.					

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes Hydric Soils Present? Yes IS THIS A WETLAND? YES	Wetland Hydrology Present? Yes Is this Sampling Point Within a Wetland? Yes Signature: _____
Remarks: This is 2.72 acre PSS1E wetland.	

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Cove Spring Restoration</u>		Date: <u>October 10, 2008</u>
Applicant/Owner: <u>Kentucky Transportation Cabinet</u>		County: <u>Franklin</u>
Investigator: <u>Robert Oney, Scott Slankard, Ryan Slack</u>		State: <u>Kentucky</u>
Do normal circumstances exist on the site?	Yes No	Community ID: _____
Is the site significantly disturbed (Atypical Situation)?	Yes No	Transect ID: _____
Is the area a potential problem area?	Yes No	Plot ID: <u>Wetland 9 (W-09)</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Xanthium strumarium</u>	H	OBL	9.		
2. <u>Bidens cernua</u>	H	OBL	10		
3. <u>Echinochloa crus-galli</u>	H	FACU	11.		
4. <u>Sagittaria latifolia</u>	H	OBL	12.		
5. <u>Cyperus strigosus</u>	H	FACW	13.		
6. <u>Ludwigia peploides</u>	H	OBL	14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW, or FAC 5/6 = 83.3%, FAC Neutral Test 4:1 (excluding FAC-).

REMARKS: **Plant community dominated by hydrophytic vegetation, and passes the FAC Neutral test.**

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in remarks): _____ Stream, Lake or Tide Gauge <input checked="" type="checkbox"/> Aerial Photos <input type="checkbox"/> Other <input type="checkbox"/> No Recorded Data Available	
Field Observations: Depth of Surface Water: <u>0-4inches</u> Depth to Free Water in Pit: <u>0 inches</u> Depth to Saturated Soil: <u>~12 inches</u>	
Wetland Hydrology Indicators: Primary Indicators: <input checked="" type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands	Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-stained Leaves <input type="checkbox"/> Local Soil Survey Data <input checked="" type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)

REMARKS: **Hydrology indicators present.**

SOILS

Map Unit Name (Series and Phase): <u>Newark silt loam, Occasionally Flooded</u> Drainage Class: <u>Poorly drained, moderately permeable soils</u> Taxonomy: <u>Mesic Aeris Fluvaquents</u> Field Observations Confirm Map Type? Yes					
Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast Common/Distinct	Texture, Concretions, Structure, etc
<u>0-16</u>		<u>10YR 5/2</u>	<u>10YR 5/6</u>		<u>Sandy Silt Loam</u>
Hydric Soil Indicators: <input type="checkbox"/> Histosol <input type="checkbox"/> Histic Epipedon <input type="checkbox"/> Sulfidic Odor <input type="checkbox"/> Aquic Moisture Regime <input type="checkbox"/> Concretions <input type="checkbox"/> Reducing Conditions <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soil <input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listed on Local Hydric Soils List <input checked="" type="checkbox"/> Listed on National Hydric soils List					

REMARKS: **Hydric soil present.**

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes	Wetland Hydrology Present? Yes
Hydric Soils Present? Yes	Is this Sampling Point Within a Wetland? Yes
IS THIS A WETLAND? YES	
Signature: _____	
Remarks: This is a 0.16 acre PEM1E wetland.	

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Cove Spring Restoration</u>		Date: <u>October 10, 2008</u>
Applicant/Owner: <u>Kentucky Transportation Cabinet</u>		County: <u>Franklin</u>
Investigator: <u>Robert Oney, Scott Slankard, Ryan Slack</u>		State: <u>Kentucky</u>
Do normal circumstances exist on the site?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Community ID: _____
Is the site significantly disturbed (Atypical Situation)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Transect ID: _____
Is the area a potential problem area?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Plot ID: <u>Wetland 8 (W-08)</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Echinochloa crus-galli</u>	<u>H</u>	<u>FACU</u>			
2. <u>Juncus effusus</u>	<u>H</u>	<u>FACW+</u>			
3. <u>Hibiscus moscheutos</u>	<u>H</u>	<u>OBL</u>			
4. <u>Xanthium strumarium</u>	<u>H</u>	<u>FAC</u>			
5. <u>Cyperus strigosus</u>	<u>H</u>	<u>FACW</u>			
6. <u>Bidens cernua</u>	<u>H</u>	<u>OBL</u>			

Percent of Dominant Species that are OBL, FACW, or FAC $5/6 = 83.3\%$, FAC Neutral Test 4:1 (excluding FAC-).

REMARKS: Plant community dominated by hydrophytic vegetation, and passes the FAC Neutral test.

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in remarks): _____ Stream, Lake or Tide Gauge <input checked="" type="checkbox"/> Aerial Photos <input type="checkbox"/> Other <input type="checkbox"/> No Recorded Data Available	
Field Observations: Depth of Surface Water: <u>0-6 inches</u> Depth to Free Water in Pit: <u>0 inches</u> Depth to Saturated Soil: <u>12 inches</u>	
Wetland Hydrology Indicators: Primary Indicators: <input checked="" type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands	Secondary Indicators (2 or more required): <input checked="" type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-stained Leaves <input type="checkbox"/> Local Soil Survey Data <input checked="" type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)

REMARKS: Hydrology indicators present.

SOILS

Map Unit Name (Series and Phase) <u>Lindside silt loam, occasionally flooded</u> Drainage Class: <u>moderately well drained with moderate to slow permeability</u> Taxonomy: <u>Fluviadentic Eutrochrepts</u>					
Field Observations Confirm Map Type? <u>No</u> Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast Common/Distinct	Texture, Concretions, Structure, etc
<u>0-5</u>		<u>10YR 3/3</u>	<u>10YR 3/1</u>		<u>Silty Loam</u>
<u>5-16</u>		<u>10YR 3/1</u>			

Hydric Soil Indicators: ☐ Histosol ☐ Histic Epipedon ☐ Sulfidic Odor ☐ Aquic Moisture Regime ☐ Concretions ☐ Reducing Conditions ☒ Gleyed or Low-Chroma Colors ☐ High Organic Content in Surface Layer in Sandy Soil ☐ Organic Streaking in Sandy Soils ☐ Listed on Local Hydric Soils List ☐ Listed on National Hydric soils List

REMARKS: Hydric soil indicators present.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes Hydric Soils Present? Yes IS THIS A WETLAND? YES	Wetland Hydrology Present? Yes Is this Sampling Point Within a Wetland? Yes Signature: _____
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REMARKS: This is a 0.27 acre PEM1E wetland.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Cove Spring Restoration</u>		Date: <u>October 10, 2008</u>
Applicant/Owner: <u>Kentucky Transportation Cabinet</u>		County: <u>Franklin</u>
Investigator: <u>Robert Oney, Ryan Slack, Scott Slankard</u>		State: <u>Kentucky</u>
Do normal circumstances exist on the site?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Community ID: _____
Is the site significantly disturbed (Atypical Situation)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Transect ID: _____
Is the area a potential problem area?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Plot ID: <u>Wetland 7 (W-07)</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Echinochloa crus-galli</u>	<u>H</u>	<u>FACU</u>	9.		
2. <u>Ludwigia peploides</u>	<u>H</u>	<u>OBL</u>	10.		
3. <u>Bidens vulgata</u>	<u>H</u>	<u>NI</u>	11.		
4. <u>Bidens cernua</u>	<u>H</u>	<u>OBL</u>	12.		
5. <u>Typha latifolia</u>	<u>H</u>	<u>OBL</u>	13.		
6. <u>Juncus effusus</u>	<u>H</u>	<u>FACW+</u>	14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW, or FAC 4/6 = 67%, FAC Neutral Test 4:1
(excluding FAC-).

REMARKS: **Plant community dominated by hydrophytic vegetation, and passes the FAC Neutral test.**

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in remarks): _____ Stream, Lake or Tide Gauge <input checked="" type="checkbox"/> Aerial Photos <input type="checkbox"/> Other <input type="checkbox"/> No Recorded Data Available	
Field Observations: Depth of Surface Water: <u>0-18 inches</u> Depth to Free Water in Pit: <u>> 16 inches</u> Depth to Saturated Soil: <u>~12 inches</u>	
Wetland Hydrology Indicators: <u>Primary Indicators:</u> <input checked="" type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands	
<u>Secondary Indicators (2 or more required):</u> <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-stained Leaves <input type="checkbox"/> Local Soil Survey Data <input checked="" type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)	

REMARKS: **Hydrology indicators present.**

SOILS

Map Unit Name (Series and Phase) <u>Lindside silt loam, occasionally flooded</u> Drainage Class: <u>moderately well drained with moderate to slow permeability</u> Taxonomy: <u>Fluviadventic Eutrochrepts</u>					
Field Observations Confirm Map Type? Yes Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc
<u>0-16</u>		<u>10YR 4/1</u>			<u>Silty Loam</u>
Hydric Soil Indicators: <input type="checkbox"/> Histosol <input type="checkbox"/> Histic Epipedon <input checked="" type="checkbox"/> Sulfidic Odor <input type="checkbox"/> Aquic Moisture Regime <input type="checkbox"/> Concretions <input type="checkbox"/> Reducing Conditions <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soil <input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listed on Local Hydric Soils List <input type="checkbox"/> Listed on National Hydric soils List					

REMARKS: **Hydric soil indicators present.**

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes Hydric Soils Present? Yes IS THIS A WETLAND? YES	Wetland Hydrology Present? Yes Is this Sampling Point Within a Wetland? Yes Signature: _____
Remarks: This is a 0.08 PEM1H fringe wetland.	

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Cove Spring Restoration</u>		Date: <u>October 10, 2008</u>
Applicant/Owner: <u>Kentucky Transportation Cabinet</u>		County: <u>Franklin</u>
Investigator: <u>Robert Oney, Scott Slankard, Ryan Slack</u>		State: <u>Kentucky</u>
Do normal circumstances exist on the site?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Community ID: _____
Is the site significantly disturbed (Atypical Situation)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Transect ID: _____
Is the area a potential problem area?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Plot ID: <u>Wetland 6 (W-06)</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u><i>Eleocharis ovata</i></u>	<u>H</u>	<u>OBL</u>	9. _____		
2. <u><i>Polygonum hydropiperoides</i></u>	<u>H</u>	<u>OBL</u>	10. _____		
3. <u><i>Echinochloa crus-galli</i></u>	<u>H</u>	<u>FACU</u>	11. _____		
4. <u><i>Polygonum persicaria</i></u>	<u>H</u>	<u>OBL</u>	12. _____		
5. <u><i>Cyperus strigosus</i></u>	<u>H</u>	<u>FACW</u>	13. _____		
6. <u><i>Ludwigia peploides</i></u>	<u>H</u>	<u>OBL</u>	14. _____		
7. <u><i>Bidens cernua</i></u>	<u>H</u>	<u>OBL</u>	15. _____		
8. _____			16. _____		

Percent of Dominant Species that are OBL, FACW, or FAC 6/7 = 85.7%, FAC Neutral Test 6:1 (excluding FAC-).

REMARKS: **Plant community dominated by hydrophytic vegetation, and passes the FAC Neutral test.**

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in remarks): _____ Stream, Lake or Tide Gauge <input checked="" type="checkbox"/> Aerial Photos <input type="checkbox"/> Other <input type="checkbox"/> No Recorded Data Available	
Field Observations: Depth of Surface Water: <u>0 inches</u> Depth to Free Water in Pit: <u>0 inches</u> Depth to Saturated Soil: <u>9 inches</u>	
Wetland Hydrology Indicators: Primary Indicators: <input type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input checked="" type="checkbox"/> Drainage Patterns in Wetlands	Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-stained Leaves <input type="checkbox"/> Local Soil Survey Data <input checked="" type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)

REMARKS: **Hydrology indicators present.**

SOILS

Map Unit Name (Series and Phase) <u>Lindside silt loam, occasionally flooded</u> Drainage Class: <u>moderately well drained with moderate to slow permeability</u>					
Taxonomy: <u>Fluvaudentic Eutrochrepts</u>					
Field Observations Confirm Map Type? Yes					
Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc
<u>6-16</u>		<u>10 YR 4/2</u>	<u>2.5YR 3/6</u>	<u>Common/Distinct</u>	<u>Sandy Silt Loam</u>
<u>0-5</u>		<u>10 YR 4/1</u>			<u>Silt Loam</u>
Hydric Soil Indicators: <input type="checkbox"/> Histosol <input type="checkbox"/> Histic Epipedon <input type="checkbox"/> Sulfidic Odor <input type="checkbox"/> Aquic Moisture Regime <input type="checkbox"/> Concretions					
<input type="checkbox"/> Reducing Conditions <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soil					
<input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listed on Local Hydric Soils List <input type="checkbox"/> Listed on National Hydric soils List					

REMARKS: **Hydric soils present.**

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes	Wetland Hydrology Present? Yes
Hydric Soils Present? Yes	Is this Sampling Point Within a Wetland? Yes
IS THIS A WETLAND? YES Signature: _____	
Remarks: This is a 0.10 acre PEM1E linear wetland.	

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Cove Spring Restoration</u>		Date: <u>October 10, 2008</u>
Applicant/Owner: <u>Kentucky Transportation Cabinet</u>		County: <u>Franklin</u>
Investigator: <u>Robert Oney, Scott Slankard, Ryan Slack</u>		State: <u>Kentucky</u>
Do normal circumstances exist on the site?	Yes <input type="checkbox"/> No <input type="checkbox"/>	Community ID: _____
Is the site significantly disturbed (Atypical Situation)?	Yes <input type="checkbox"/> No <input type="checkbox"/>	Transect ID: _____
Is the area a potential problem area?	Yes <input type="checkbox"/> No <input type="checkbox"/>	Plot ID: <u>Wetland 5 (W-05)</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u><i>Typha latifolia</i></u>	<u>H</u>	<u>OBL</u>	9. <u><i>Boehmeria cylindrica</i></u>	<u>H</u>	<u>FACW+</u>
2. <u><i>Conium maculatum</i></u>	<u>H</u>	<u>FACW</u>	10. _____		
3. <u><i>Eupatorium perfoliatum</i></u>	<u>H</u>	<u>FACW</u>	11. _____		
4. <u><i>Dipsacus fullonum</i></u>	<u>H</u>	<u>NI</u>	12. _____		
5. <u><i>Mentha spicata</i></u>	<u>H</u>	<u>FACW+</u>	13. _____		
6. <u><i>Eupatorium serotinum</i></u>	<u>H</u>	<u>FAC-</u>	14. _____		
7. <u><i>Bidens vulgata</i></u>	<u>H</u>	<u>NI</u>	15. _____		
8. <u><i>Impatiens capensis</i></u>	<u>H</u>	<u>FACW</u>	16. _____		

Percent of Dominant Species that are OBL, FACW, or FAC 6/9 = 67%, FAC Neutral Test 6:0 (excluding FAC-).

REMARKS: **Plant community dominated by hydrophytic vegetation, and passes the FAC Neutral test.**

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in remarks): _____ Stream, Lake or Tide Gauge <input checked="" type="checkbox"/> Aerial Photos <input type="checkbox"/> Other <input type="checkbox"/> No Recorded Data Available	
Field Observations: Depth of Surface Water: <u>0 inches</u> Depth to Free Water in Pit: <u>0 inches</u> Depth to Saturated Soil: <u>0 inches</u>	
Wetland Hydrology Indicators: Primary Indicators: <input type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands	Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-stained Leaves <input type="checkbox"/> Local Soil Survey Data <input checked="" type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)

REMARKS: **Hydrology indicators present.**

SOILS

Map Unit Name (Series and Phase) <u>Lindside silt loam, occasionally flooded</u> Drainage Class: <u>moderately well drained with moderate to slow permeability</u>					
Taxonomy: <u>Fluviadventic Eutrochrepts</u>					
Field Observations Confirm Map Type? <u>Yes</u>					
Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc
<u>0-16</u>		<u>10 YR 4/2</u>	<u>7.5YR 4/6</u>	<u>Few/Distinct</u>	<u>Silty Loam</u>
Hydric Soil Indicators: <input type="checkbox"/> Histosol <input type="checkbox"/> Histic Epipedon <input type="checkbox"/> Sulfidic Odor <input type="checkbox"/> Aquic Moisture Regime <input type="checkbox"/> Concretions					
<input type="checkbox"/> Reducing Conditions <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soil					
<input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listed on Local Hydric Soils List <input type="checkbox"/> Listed on National Hydric soils List					

REMARKS: **Hydric soils present.**

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes	Wetland Hydrology Present? Yes
Hydric Soils Present? Yes	Is this Sampling Point Within a Wetland? Yes
IS THIS A WETLAND? YES Signature: _____	
Remarks: This is a 0.11 acre PEM1E linear wetland.	

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Cove Spring Restoration</u>		Date: <u>October 9, 2008</u>
Applicant/Owner: <u>Kentucky Transportation Cabinet</u>		County: <u>Franklin</u>
Investigator: <u>Robert Oney, Shane Roberts</u>		State: <u>Kentucky</u>
Do normal circumstances exist on the site?	Yes <input type="checkbox"/> No <input type="checkbox"/>	Community ID: _____
Is the site significantly disturbed (Atypical Situation)?	Yes <input type="checkbox"/> No <input type="checkbox"/>	Transect ID: _____
Is the area a potential problem area?	Yes <input type="checkbox"/> No <input type="checkbox"/>	Plot ID: <u>Wetland 4 (W-04)</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u><i>Typha latifolia</i></u>	<u>H</u>	<u>OBL</u>	9. <u><i>Scirpus atrovirens</i></u>	<u>H</u>	<u>OBL</u>
2. <u><i>Sagittaria latifolia</i></u>	<u>H</u>	<u>OBL</u>	10. <u><i>Epilobium coloratum</i></u>	<u>H</u>	<u>OBL</u>
3. <u><i>Lemna minor</i></u>	<u>H</u>	<u>OBL</u>	11. <u><i>Leersia oryzoides</i></u>	<u>H</u>	<u>OBL</u>
4. <u><i>Cyperus strigosus</i></u>	<u>H</u>	<u>FACW</u>	12. _____		
5. <u><i>Ageratina altissima</i></u>	<u>H</u>	<u>FACU+</u>	13. _____		
6. <u><i>Hibiscus moscheutos</i></u>	<u>H</u>	<u>OBL</u>	14. _____		
7. <u><i>Bidens cernua</i></u>	<u>H</u>	<u>OBL</u>	15. _____		
8. <u><i>Juncus effusus</i></u>	<u>H</u>	<u>FACW+</u>	16. _____		

Percent of Dominant Species that are OBL, FACW, or FAC 10/11 = 91%, FAC Neutral Test 10:1
(excluding FAC-).

REMARKS: **Plant community dominated by hydrophytic vegetation, and passes the FAC Neutral test.**

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in remarks): _____ Stream, Lake or Tide Gauge <input checked="" type="checkbox"/> Aerial Photos <input type="checkbox"/> Other <input type="checkbox"/> No Recorded Data Available	
Field Observations: Depth of Surface Water: <u>0-12 inches</u> Depth to Free Water in Pit: <u>4 inches</u> Depth to Saturated Soil: <u>2 inches</u>	
Wetland Hydrology Indicators: Primary Indicators: <u>X</u> Inundated <u>X</u> Saturated in Upper 12 inches _____ Water Marks _____ Drift Lines _____ Sediment Deposits <u>X</u> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): _____ Oxidized Root Channels in Upper 12 inches _____ Water-stained Leaves _____ Local Soil Survey Data <u>X</u> FAC-Neutral Test _____ Other (Explain in Remarks)	

REMARKS: **Hydrology indicators present.**

SOILS

Map Unit Name (Series and Phase) <u>Lindside silt loam, occasionally flooded</u> Drainage Class: <u>moderately well drained with moderate to slow permeability</u> Taxonomy: <u>Fluviaduentic Eutrochrepts</u>																	
Field Observations Confirm Map Type? <u>No</u>																	
Profile Description: <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Depth (inches)</th><th>Horizon</th><th>Matrix Color (Munsell Moist)</th><th>Mottle Colors (Munsell Moist)</th><th>Mottle Abundance/Contrast</th><th>Texture, Concretions, Structure, etc</th></tr> </thead> <tbody> <tr> <td><u>0-16</u></td><td></td><td><u>Gley1 4/10Y</u></td><td><u>Gley1 2.5N</u></td><td><u>Few/Distinct</u></td><td><u>Silt Loam</u></td></tr> </tbody> </table>						Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc	<u>0-16</u>		<u>Gley1 4/10Y</u>	<u>Gley1 2.5N</u>	<u>Few/Distinct</u>	<u>Silt Loam</u>
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc												
<u>0-16</u>		<u>Gley1 4/10Y</u>	<u>Gley1 2.5N</u>	<u>Few/Distinct</u>	<u>Silt Loam</u>												
Hydric Soil Indicators: <u>_____</u> Histosol <u>_____</u> Histic Epipedon <u>X</u> Sulfidic Odor <u>_____</u> Aquic Moisture Regime <u>_____</u> Concretions <u>_____</u> Reducing Conditions <u>X</u> Gleyed or Low-Chroma Colors <u>_____</u> High Organic Content in Surface Layer in Sandy Soil <u>_____</u> Organic Streaking in Sandy Soils <u>_____</u> Listed on Local Hydric Soils List <u>_____</u> Listed on National Hydric soils List																	

REMARKS: **Hydric soil indicators present.**

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes	Wetland Hydrology Present? Yes
Hydric Soils Present? Yes	Is this Sampling Point Within a Wetland? Yes
IS THIS A WETLAND? YES	
Signature: _____	
Remarks: This is 0.06 acre PEM1E wetland.	

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Cove Spring Restoration</u>		Date: <u>October 9, 2008</u>
Applicant/Owner: <u>Kentucky Transportation Cabinet</u>		County: <u>Franklin</u>
Investigator: <u>Robert Oney, Shane Roberts</u>		State: <u>Kentucky</u>
Do normal circumstances exist on the site?	Yes No	Community ID: _____
Is the site significantly disturbed (Atypical Situation)?	Yes No	Transect ID: _____
Is the area a potential problem area?	Yes No	Plot ID: <u>Wetland 3 (W-03)</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Echinochloa crus-galli</u>	<u>H</u>	<u>FACU</u>	9.		
2. <u>Bidens cernua</u>	<u>H</u>	<u>OBL</u>	10.		
3. <u>Lemna minor</u>	<u>H</u>	<u>OBL</u>	11.		
4. <u>Cyperus strigosus</u>	<u>H</u>	<u>FACW</u>	12.		
5. <u>Hibiscus moscheutos</u>	<u>H</u>	<u>OBL</u>	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW, or FAC 4/5 = 80%, FAC Neutral Test 4:1 (excluding FAC-).

REMARKS: **Plant community dominated by hydrophytic vegetation, and passes the FAC Neutral test.**

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in remarks): _____ Stream, Lake or Tide Gauge <input checked="" type="checkbox"/> Aerial Photos <input type="checkbox"/> Other <input type="checkbox"/> No Recorded Data Available	
Field Observations: Depth of Surface Water: <u>0-18 inches</u> Depth to Free Water in Pit: <u>>16 inches</u> Depth to Saturated Soil: <u>>16 inches</u>	
Wetland Hydrology Indicators: <u>Primary Indicators:</u> <input checked="" type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands	
<u>Secondary Indicators (2 or more required):</u> <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-stained Leaves <input type="checkbox"/> Local Soil Survey Data <input checked="" type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)	
REMARKS: Hydrology indicators present.	

SOILS

Map Unit Name (Series and Phase): <u>Newark silt loam, Occasionally Flooded</u> Drainage Class: <u>Poorly drained, moderately permeable soils</u> Taxonomy: <u>Mesic Aeric Fluvaquents</u> Field Observations Confirm Map Type? <u>Yes</u>					
Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc
<u>0-8</u>		<u>10YR 3/1</u>	<u>10YR 5/4</u>	<u>Few/Distinct</u>	<u>Silty Loam</u>
<u>8-16</u>		<u>10YR 4/2</u>	<u>7.5YR 4/6</u>	<u>Common/Faint</u>	<u>Silty Loam</u>
Hydric Soil Indicators: <input type="checkbox"/> Histosol <input type="checkbox"/> Histic Epipedon <input type="checkbox"/> Sulfidic Odor <input type="checkbox"/> Aquic Moisture Regime <input checked="" type="checkbox"/> Concretions <input type="checkbox"/> Reducing Conditions <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soil <input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listed on Local Hydric Soils List <input checked="" type="checkbox"/> Listed on National Hydric soils List					
REMARKS: Hydric soils present.					

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes	Wetland Hydrology Present? Yes
Hydric Soils Present? Yes	Is this Sampling Point Within a Wetland? Yes
IS THIS A WETLAND? YES	Signature:
Remarks: This is a 0.91 acre PEM1E wetland.	

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Cove Spring Restoration</u>		Date: <u>September 9, 200</u>
Applicant/Owner: <u>Kentucky Transportation Cabinet</u>		County: <u>Franklin</u>
Investigator: <u>R. Oney, S. Slankard, S. Roberts, T. Brown</u>		State: <u>Kentucky</u>
Do normal circumstances exist on the site?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Community ID: _____
Is the site significantly disturbed (Atypical Situation)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Transect ID: _____
Is the area a potential problem area?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Plot ID: <u>Wetland 11 (W-11)</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u><i>Typha latifolia</i></u>	<u>H</u>	<u>OBL</u>	9. <u><i>Leersia oryzoides</i></u>	<u>H</u>	<u>OBL</u>
2. <u><i>Bidens cernua</i></u>	<u>H</u>	<u>OBL</u>	10. <u><i>Platanus occidentalis</i></u>	<u>S</u>	<u>FACW-</u>
3. <u><i>Polygonum hydropiperoides</i></u>	<u>H</u>	<u>FACW+</u>	11. <u><i>Acer negundo</i></u>	<u>S</u>	<u>FAC+</u>
4. <u><i>Xanthium strumarium</i></u>	<u>H</u>	<u>FAC</u>	12. _____		
5. <u><i>Hibiscus moscheutos</i></u>	<u>H</u>	<u>OBL</u>	13. _____		
6. <u><i>Eupatorium serotinum</i></u>	<u>H</u>	<u>FAC-</u>	14. _____		
7. <u><i>Conoclinium coelestinum</i></u>	<u>H</u>	<u>FAC</u>	15. _____		
8. <u><i>Boehmeria cylindrica</i></u>	<u>H</u>	<u>FACW+</u>	16. _____		

Percent of Dominant Species that are OBL, FACW, or FAC 10/11=91%, FAC Neutral Test 7:0
(excluding FAC-).

REMARKS: **Plant community dominated by hydrophytic vegetation, and passes the FAC Neutral test.**

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in remarks): _____ Stream, Lake or Tide Gauge <input checked="" type="checkbox"/> Aerial Photos <input type="checkbox"/> Other <input type="checkbox"/> No Recorded Data Available	
Field Observations: Depth of Surface Water: <u>0 inches</u> Depth to Free Water in Pit: <u>10 inches</u> Depth to Saturated Soil: <u>8 inches</u>	
Wetland Hydrology Indicators: Primary Indicators: <input type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input checked="" type="checkbox"/> Drainage Patterns in Wetlands	Secondary Indicators (2 or more required): <input checked="" type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-stained Leaves <input type="checkbox"/> Local Soil Survey Data <input checked="" type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)

REMARKS: **Hydrology indicators present.**

SOILS

Map Unit Name (Series and Phase): <u>Newark silt loam, Occasionally Flooded</u> Drainage Class: <u>Poorly drained, moderately permeable soils</u> Taxonomy: <u>Mesic Aeric Fluvaquents</u> Field Observations Confirm Map Type? <u>No</u>					
<i>Profile Description:</i>					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc
<u>0-3</u>		<u>10YR 3/2</u>		<u>None</u>	<u>silt loam/organics</u>
<u>3-16</u>		<u>10YR 3/2</u>		<u>None</u>	<u>silt loam</u>
Hydric Soil Indicators: <input type="checkbox"/> Histosol <input type="checkbox"/> Histic Epipedon <input type="checkbox"/> Sulfidic Odor <input type="checkbox"/> Aquic Moisture Regime <input type="checkbox"/> Concretions <input type="checkbox"/> Reducing Conditions <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soil <input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listed on Local Hydric Soils List <input type="checkbox"/> Listed on National Hydric soils List					

REMARKS: **Hydric soils present.**

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes	Wetland Hydrology Present? Yes
Hydric Soils Present? Yes	Is this Sampling Point Within a Wetland? Yes
IS THIS A WETLAND? YES	Signature: _____
Remarks: This is 0.29 acre PEM1E wetland.	

Attachment 7

U.S. Fish and Wildlife Service Early Coordination Letter



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Kentucky Ecological Services Field Office
330 West Broadway, Suite 265
Frankfort, Kentucky 40601
(502) 695-0468
December 19, 2007

Mr. James Lane
Kentucky Department of Fish and Wildlife Resources
#1 Sportsman's Lane
Frankfort, KY 40601

Subject: FWS #2008-B-0184, Cove Spring Branch and Penitentiary Branch Stream
Restoration and Enhancement, Franklin County, Kentucky

Dear Mr. Lane:

We have reviewed the Preliminary Scope of Work and Cost Estimate (Scope) for the restoration and enhancement of Cove Spring Branch and Penitentiary Branch in Franklin County, Kentucky. According to this Scope, the proposed work will involve the restoration and enhancement of 3,000 linear feet of Cove Spring Branch and 3,150 linear feet of Penitentiary Branch.

According to our databases, four federally listed species and one candidate species are known or have the potential to occur within Franklin County, and could be affected by the proposed action. The listed species are:

<u>Common Name</u>	<u>Scientific Name</u>	<u>Federal Status</u>
Indiana bat	<i>Myotis sodalis</i>	endangered
Gray bat	<i>Myotis grisescens</i>	endangered
Braun's rockcress	<i>Arabis perstellata</i>	endangered
Globe bladderpod	<i>Physaria lesquerella</i>	candidate
Running buffalo clover	<i>Trifolium stoloniferum</i>	endangered

We must also advise you that collection records available to the Service may not be all-inclusive. Our database is a compilation of collection records made available by various individuals and resource agencies. This information is seldom based on comprehensive surveys of all potential habitats and thus does not necessarily provide conclusive evidence that protected species are present or absent at a specific locality.

According to Service records, summer roost and/or winter habitat for the endangered Indiana bat (*Myotis sodalis*) and gray bat (*Myotis grisescens*) may exist within the proposed project site. Based on this information, the Service believes that: (1) forested areas in the vicinity of and on the project area may provide potentially suitable summer roosting and foraging habitat for the Indiana bat and potentially suitable foraging habitat for the gray bat (if suitable

roosting sites are present); and (2) caves, rock shelters, and abandoned underground mines in the vicinity of and on the project area may provide potentially suitable winter hibernacula habitat for the Indiana bat and/or potentially suitable summer roosting and winter hibernacula habitat for the gray bat.

Indiana Bat

The Indiana bat utilizes a wide array of forested habitats, including riparian forests, bottomlands, and uplands for both summer foraging and roosting habitat. Indiana bats typically roost under exfoliating bark, in cavities of dead and live trees, and in snags (i.e., dead trees or dead portions of live trees). Trees in excess of 16 inches diameter at breast height (DBH) are considered optimal for maternity colony roosts, but trees in excess of nine inches DBH appear to provide suitable maternity roosting habitat. Male Indiana bats have been observed roosting in trees as small as three inches DBH.

Prior to hibernation Indiana bats utilize the forest habitat around the hibernacula where they feed and roost until temperatures drop to a point that forces them into hibernation. This “swarming” period lasts, depending on weather conditions in a particular year, from approximately September 15 to November 15. This is a critical time for Indiana bats because they are acquiring additional fat reserves and mating prior to hibernation. Research has shown that bats exhibiting this “swarming” behavior will range up to ten miles from chosen hibernacula during this time. Indiana bats prefer limestone caves, sandstone rock shelters, and abandoned underground mines with stable temperatures of 39 to 46 degrees F and humidity above 74 percent but below saturation for hibernation.

Gray Bats

Gray bats roost, breed, rear young, and hibernate in caves year round. They migrate between summer and winter caves and will also use transient or stopover caves. The roost site must have an average temperature of 42 to 52 degrees F for hibernation. Most of the caves used by gray bats for hibernation have deep vertical passages with large rooms that function as cold air traps. Summer caves must be warm, between 57 and 77 degrees F, or have small rooms or domes that can trap the body heat of roosting bats. Summer caves are normally located close to rivers or lakes where the bats feed. Gray bats have been known to fly as far as 12 miles from their colony to feed.

Braun's Rock Cress

Braun's rock cress (*Arabis perstellata*) is a federally endangered species known to occur within Cove Spring Park. A survey of this property was conducted in spring 2007 by the Kentucky State Nature Preserves Commission and the City of Frankfort, and Braun's rock cress was identified on the rocky slopes adjacent to the proposed stream restoration area (Deborah White, pers. comm.). Since the proposed stream restoration work will not impact the wooded hillside where Braun's rock cress is known to occur and neither the globe bladderpod nor running buffalo clover were observed during the survey, we concur with the determination that the proposed project is not likely to adversely affect these species.

Recommendations

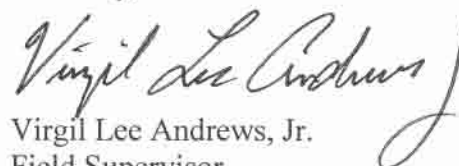
Because there are concerns regarding species that relate to the project and because there is a lack of occurrence information available on these species relative to the proposed project area, the following recommendations relative to Indiana bats and gray bats are suggested:

- 1) Based on the presence of numerous caves, rock shelters, and underground mines in Kentucky, it is reasonable to assume that other caves, rock shelters, and/or abandoned underground mines may occur within the project area. If these habitats occur, they could provide winter habitat for Indiana bats and/or summer and winter habitat for the gray bat. Therefore, the Service recommends a survey of the project area for caves, rock shelters, and underground mines, the identification of any such habitats that exist on-site, and avoidance of impacts to those sites pending an analysis of their suitability as Indiana/gray bat habitat by this office.
- 2) The Service also recommends that trees within the project (construction) area only be removed between October 15 and March 31 to avoid impacting summer roosting Indiana bats. However, if any Indiana bat hibernacula are identified on the project area or are known to occur within 10 miles of the project area, it is recommended the applicant only remove trees between November 15 and March 31 in order to avoid impacting Indiana bat "swarming" behavior.
- 3) If the KDFWR wishes to selectively harvest only suitable Indiana bat roost trees within the tree clearing restriction time frames, the Service recommends that the potential roost trees be identified and marked by a qualified bat biologist prior to clearing. After the trees have been selectively harvested and prior to the end of the tree clearing period, the qualified bat biologist should return to the site to confirm that all potential roost trees within the construction limits have been removed. A report should be submitted to the Service documenting the removal of the roost trees.

If you need additional assistance in determining if a proposed project may impact a federally listed species, we recommend that you contact us for further assistance. Thank you for the opportunity to comment on this proposed action.

If you have any questions regarding the information which we have provided, please contact Jennifer Garland at (502)695-0468 extension 115.

Sincerely,



Virgil Lee Andrews, Jr.
Field Supervisor



KY FIELD OFFICE

JAN 16 2008

KENTUCKY DEPARTMENT OF FISH & WILDLIFE RESOURCES
COMMERCE CABINET

RECEIVED

Steven L. Beshear
Governor

#1 Sportsman's Lane
Frankfort, Kentucky 40601
Phone (502) 564-3400
1-800-858-1549
Fax (502) 564-0506
fw.ky.gov

Marcheta Sparrow
Secretary

Dr. Jonathan W. Gassett
Commissioner

January 10, 2008

Lee Andrews
US Fish and Wildlife Service
Kentucky Field Office
JC Watts Federal Bldg, Rm 266
330 West Broadway
Frankfort, KY 40601

Re: Section 7 ESA Consultation – FWS #2008-B-0184
Stream Restoration and Enhancement – Cove Spring Branch and Penitentiary Branch
Franklin County, Kentucky

Dear Mr. Andrews:

The Kentucky Department of Fish and Wildlife Resources (KDFWR) is in receipt of your December 19, 2007 letter requesting written concurrence with recommendations made by your office to minimize/avoid negative impacts to Indiana bats (*Myotis sodalis*) and gray bats (*M. grisescens*) on the above-referenced stream restoration project. The following recommendations are accepted and will be implemented.

1. Disturbance to any caves, rock shelters, and/or abandoned mines will be avoided within the project area. If any caves, rock shelters, or abandoned mines are found to be within the footprint of the project, your office will be notified to analyze their suitability as *M. sodalis* habitat, or the project will be redesigned to avoid impacts.
2. Trees within the project area larger than five inches DBH will be removed between November 15 and March 31. If removal of trees is necessary outside of that time-frame, KDFWR will conduct a *M. sodalis* survey or provide site-specific information that shows: (a) no potentially suitable summer and/or winter habitat exists within the project area or vicinity; or (b) *M. sodalis* would not be present within the project area or its vicinity because of site-specific factors.

Page 2
Mr. Andrews
January 10, 2008

KDFWR looks forward to working with you to complete the referenced project. Please let me know if you have any questions regarding the above.

Sincerely,



James S. Lane, Jr.
Environmental Scientist

Cc: Mike Hardin, Environmental Section Chief
Bill Sampson, Environmental Section
Joseph Zimmerman, Environmental Section
Sunni Carr, Wildlife Diversity Program Coordinator
Dr. Patricia A. Grace-Jarrett, USCOE, Louisville District

2008-I-Q241 even8



"Lane, Jim (FW)"
<Jim.Lane@ky.gov>
01/23/2008 09:01 AM

To <Jennifer_Garland@fws.gov>
cc "Hardin, Mike (FW)" <Mike.Hardin@ky.gov>
bcc
Subject RE: Letters

Jenny - My mistake.

The revised acceptance for the Cove Spring and Shultz Creek projects reads as follows:

1. Disturbance to any caves, rock shelters, and/or abandoned mines will be avoided within the project area. If any caves, rock shelters, or abandoned mines are found to be within the footprint of the project, your office will be notified to analyze their suitability as *M. sodalis* and *M. grisescens* habitat, or the project will be redesigned to avoid impacts.

Jim Lane
Kentucky Dept. of Fish & Wildlife Resources
Stream and Wetland Restoration Program
3761 Georgetown Road
Frankfort, KY 40601
Phone - 502/573-0330, x222 Fax - 502/573-0335

Did you know?? The Kentucky Department of Fish and Wildlife Resources receives no tax dollars and manages fish and wildlife for all citizens.

Confidentiality Notice: This e-mail message, including any attachments, is for the sole use of the intended recipient(s) and may contain confidential information. Any unauthorized review, use, disclosure or distribution is strictly prohibited. If you are not the intended recipient, please contact the sender by e-mail and destroy all copies of the original message.

-----Original Message-----

From: Jennifer_Garland@fws.gov [mailto:Jennifer_Garland@fws.gov]
Sent: Friday, January 18, 2008 4:39 PM
To: Lane, Jim (FW)
Cc: Hardin, Mike (FW)
Subject: Letters

Jim,

Thanks for the recent letters accepting the concurrence recommendations. For the Shultz Creek and Cove Spring projects recommendations were made for both Indiana and Gray bats. While the introductions on the letters stated that recommendations were accepted for both species, the specific items describing the measures to be taken only referred to the Indiana bat. Could you revise your acceptance of recommendation #1 for these two projects? An email is sufficient. Thank you!

Jennifer M. Garland
U.S. Fish and Wildlife Service
J C Watts Federal Building - Room 265
330 West Broadway
Frankfort, KY 40601

Attachment 8

Kentucky Archaeological Society Letter

Kentucky Archaeological Survey

Jointly administered by the Kentucky Heritage Council
and the University of Kentucky Department of Anthropology



October 2, 2008

Dear Suzanne,

I have enclosed two archaeological reports in regards to the Cove Springs Park Stream Restoration Project in Franklin County, Kentucky. Kentucky Archaeological Survey Report No. 61, addresses two archaeological sites within the park. I have spoken with Mike Lighthiser and he understands that a visit by an archaeologist to assess your project impact area is not required. However, the remains of the City of Frankfort Water Works (15Fr155) and the Cove Springs Farmstead (15Fr156) have been documented on the property.

The water works remains consists of several historic features (structural remains) that are considered to be potentially eligible for listing in the National Register of Historic Places. It has been recommended that the structural remains be protected. In addition, Kentucky Archaeological Survey Report No. 72 states that a dry-laid stone fence forms part of the parks western boundary. It has been recommended that the fence be protected and interpreted as an important landscape feature. I am sending you these reports to provide you with more detailed information. If you have any questions do not hesitate to contact me at my office.

Sincerely,

A handwritten signature in cursive script, reading "Eric J. Schlarb".

Eric J. Schlarb
Staff Archaeologist
Kentucky Archaeological Survey

Attachment 9

Conservation Easements

- 7.10** To obtain authorization for the Mayor to execute a Deed of Easement on behalf of the City granting a conservation easement to the Commonwealth Of Kentucky, for the use and benefit of the Tourism, Arts and Heritage Cabinet, Department of Fish and Wildlife Resources

Purpose: The purpose of this item is to obtain authorization for the Mayor to execute a Deed of Easement on behalf of the City granting a conservation easement to the Commonwealth Of Kentucky, for the use and benefit of the Tourism, Arts and Heritage Cabinet, Department of Fish and Wildlife Resources. This easement is to protect the banks of the stream at Cove Spring Park after the restoration and remediation work has been completed. The Department of Fish and Wildlife has agreed to spend in excess of \$1.2 million dollars to complete the stream restoration and remediation.

Background: The subject of this item is a Deed of Easement from the City of Frankfort granting a conservation easement to the Commonwealth Of Kentucky, for the use and benefit of the Tourism, Arts and Heritage Cabinet, Department of Fish and Wildlife Resources. This easement is to protect the banks of the stream at Cove Spring Park after the restoration and remediation work has been completed. The Department of Fish and Wildlife has agreed to spend in excess of \$1.2 million dollars to complete the stream restoration and remediation. In the event the restoration and remediation work is not completed, the easement will be null and void.

Recommendation: Approval

Attachment:

- Cove Spring Conservation Easement

SRD
7/24/09

Contact Persons:

Name:	Jim Parrish	Rob Moore
Title:	Co-director	City Solicitor
Department:	Parks and Recreation	
Phone:	502/875-8575	502/227-2271
Email:	jparrish@frankfort.ky.gov	rmoore@hazelcox.com

Approved by Commission

7-27-09
[Signature]
City Clerk

cc - Solicitor
Parks & Rec

DEED OF CONSERVATION EASEMENT

THIS DEED OF CONSERVATION EASEMENT is entered into by and between the City of Frankfort, Kentucky, 315 W. 2nd Street, Frankfort, KY 40601 (hereinafter "Grantor") and COMMONWEALTH OF KENTUCKY, for the use and benefit of the Tourism, Arts and Heritage Cabinet, Department of Fish and Wildlife Resources, 1 Sportsman's Lane, Frankfort, KY 40601, by and through Jonathan Miller, Secretary, Finance and Administration Cabinet, (hereinafter "Grantee").

WITNESS THAT:

WHEREAS, the Grantor is the landowner of certain real property (hereinafter "Project Area") located in Franklin County, Kentucky, and more particularly described in the "Project Area Description" attached hereto and incorporated herein as Exhibit A; and

WHEREAS, the Project Area will be improved by creating better access to a floodplain, bank stabilization, establishment of riparian zone, and creating better aquatic habitat; and

WHEREAS, the remainder of the Project Area remains in a substantially undisturbed, natural state and has significant value as stream habitat; and

WHEREAS, the Grantee is a governmental body empowered to hold an interest in real property under the laws of the Commonwealth of Kentucky and the United States and, therefore, qualifies as a holder pursuant to KRS 382.800; and

WHEREAS, both Grantor and Grantee desire to retain and protect the natural, scenic, and open-space values of the Project Area, and assure the Project Area's availability for agricultural, forest, recreational, and open-space use, protecting natural resources, maintaining or enhancing air or water quality, or preserving the historical, architectural, or cultural aspects of the Project Area; and

WHEREAS, KRS 382.800 through KRS 382.860 permits the creation of conservation easements for the purposes of, inter alia, retaining land or water areas predominantly in their natural, scenic, open or wooded condition or as suitable habitat for fish, plants, or wildlife and to insure that the areas will be available for agricultural, forest, recreational, educational, or open-space use; and

NOW, THEREFORE, in consideration of the mutual covenants contained herein; and further, pursuant to KRS 382.800 through 382.860, Grantor does hereby convey to Grantee a Conservation Easement (hereinafter "Easement") in perpetuity over the Project Area to be held for the benefit of the people of the Commonwealth of Kentucky and consisting of the following:

- (1) The Project Area shall be maintained in perpetuity for the following purpose:

stream habitat
- (2) Grantee shall manage the Project Area in strict accordance with:
 - (a) KRS Chapter 150
 - (b) KRS 382.800 through 382.860, and
 - (c) The detailed channel design plan pertaining to the Project Area which has been generated by the Grantee, attached hereto as Exhibit "A".
- (3) The Grantee has the right of visual access to and view of the Project Area in its natural, scenic, open and undisturbed condition.
- (4) The Grantee has the right to enter the Project Area, in a reasonable manner and at reasonable times, for the purposes of management and construction of the project. These purposes shall also include inspection of the Project Area to determine compliance with this Easement and to repair any damages to the area, thus ensuring that the project remains in compliance with this Easement.
- (5) There shall be no removal, destruction, cutting, trimming, mowing, alteration, or spraying with biocides of any vegetation, nor any disturbance or change in the natural habitat within the Project Area in any manner unless addressed in the final design plan or specifically authorized by the Grantee.
- (6) There shall be no planting or introduction of any species of vegetation within the Project Area unless addressed in the final design plan or specifically authorized by the Grantee.
- (7) There shall be no harvesting of timber within the Project Area unless addressed in the final design plan or specifically authorized by the Grantee.
- (8) There shall be no commercial or industrial activity undertaken or allowed within the Project Area, nor shall any right of passage across or upon the Project Area be allowed or granted if that right of passage is used in conjunction with commercial or industrial activity. (KRS 382.800(1) clearly references agricultural usage.)
- (9) Grantor shall be allowed to remove trash and debris from the Project Area.

- (10) Except as deemed necessary by the Grantee in completing the channel design plan, there shall be no filling, excavation, or dredging within the Project Area.
- (11) There shall be no mining or drilling within the Project Area.
- (12) There shall be no removal of topsoil, sand, gravel, rock, minerals or other materials within the Project Area without consent of KDFWR.
- (13) There shall be no dumping of ashes, trash, garbage, or any other material within the Project Area.
- (14) There shall be no changing of the topography within the Project Area in any manner without consent of KDFWR.
- (15) There shall be no construction or placing of temporary or permanent buildings, mobile homes, advertising signs, billboards, or other advertising material, or other structures within the Project Area.
- (16) Except with the written consent of the Grantee, there shall be no building of new roads, trails, or other rights of way within the Project Area. Existing trails and roads may be maintained by reasonable means consistent with the purposes of this Easement
- (17) There shall be no introduction of non-native wildlife as defined by 301 KAR 2:081 and 301 KAR 1:122 into the Project Area without the written consent of the Grantee. (Plants are covered in paragraph 6.)
- (18) Except as deemed necessary by the Grantee in completing the channel design plan, there shall be no damming, dredging or construction in any free-flowing water body, nor construction of any weirs, groins, or dikes in any wetlands, or any manipulation or alteration of natural water courses, fresh water lake or pond shores, marshes, wetlands, or other water bodies nor any activities or uses detrimental to water purity within the Project Area.
- (19) Except as deemed necessary by the Grantee in completing the channel design plan, there shall be no operation of mechanical or motorized vehicles within the stream channel, not including designated crossings. Mechanical or motorized vehicles shall cross perpendicular to the channel, as opposed to, driving the vehicle up and down the length of the stream.
- (20) Where applicable, there shall be no destruction of fencing placed within the Project Area. After the five-year monitoring period the

Grantor agrees to maintain the fence in a condition that equal or better than its condition when received from the Grantee.

- (21) Any use of the Project Area or any activity thereon which, in the opinion of the Grantee, is or may become inconsistent with the purpose of this Easement, which is the preservation of the area in its natural and undisturbed condition for the purposes set out in KRS 382.800(1) and the management and protection of its environmental systems, is prohibited.
- (22) In the event of a violation of any term, condition, or restriction contained in this Easement, the Grantee may immediately enforce any of the remedies available to it under this contract or by law. Any failure by the Grantee to avail itself of these remedies shall not be deemed to be a waiver or forfeiture of the right to enforce any term, condition, covenant or purpose of this Easement.
- (23) In the event that damage is caused to the Project Area by a deliberate, reckless or negligent act of Grantor, its successors, or assigns, then Grantor shall be responsible for the reasonable costs of remediation.
- (24) This Easement shall be a burden upon and shall run with the Project Area in perpetuity and shall bind the Grantor, its successors and assigns forever, except upon written notice of abandonment of the project by Grantee to Grantor.
- (25) The rights herein granted shall be in addition to, and not in limitation of, any other rights and remedies available to the Grantee for protection of the Project Area.
- (26) This easement does not grant access to the property by the general public.
- (27) Grantor agrees to indemnify and hold harmless Grantee, its agents, officers and assigns from any claims arising from injury or damages resulting from any negligent actions of the Grantee, its agents, officers, or employees.
- (28) Neither Grantee nor Grantor shall be responsible for acts by third parties.
- (29) In the event that the project is not implemented, this Easement shall become null and void.
- (30) Grantee shall have no duty to maintain this Project Area after five years from the date of completion of the project unless otherwise required by statute.

Notary Public, State-at-Large
My Commission expires _____

THIS INSTRUMENT PREPARED BY:

Nick Ozburn _____
Fisheries Division
#1 Sportsman's Lane
Frankfort, KY 40601

EXHIBIT “A”

Project Area Description

The “Project Area” referenced in the conservation easement is described as follows:

The project area is described as follows for three parcels belonging to the City of Frankfort, Kentucky within Cove Spring Park (*see Overview Map*):

Parcel 1: Parcel # 073-00-00-032.01

Deedbook 469 pg. 832

The project area includes the stream bed and property adjacent to each side of Penitentiary Branch (*see Parcel 1 Map*). The project area is 6.75 acres in area and shall extend to the eastern, western, and southern property boundaries. It shall extend northward from the centerline of the constructed stream channel for approximately 400 feet. The northern extent of the project area follows a line on coordinates (-84.86053, 38.22181; -84.85773, 38.22145; -84.85794, 38.2208; -84.85777, 38.22074).

Parcel 2: Parcel # 073-00-00-031

Deedbook 453 pg. 264

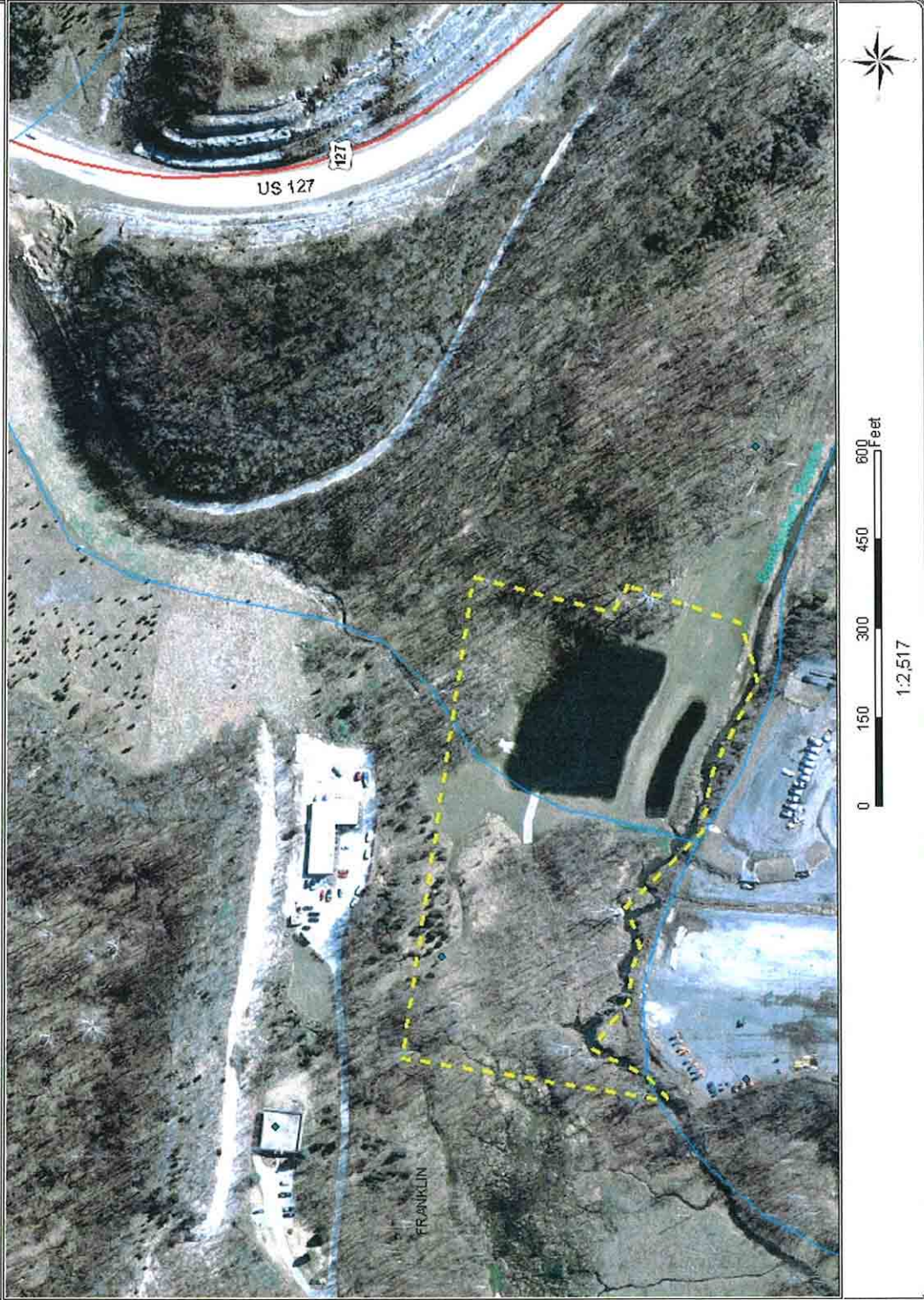
The project area includes the stream bed and property adjacent to each side of Penitentiary Branch (*see Parcel 2 Map*). The project is 22.5 acres in area. It extends to the eastern, southern, and western property boundaries. It extends northward approximately 400 feet from the centerline of the stream channel. The northern extent of the project area follows a line on the coordinates (-84.85776, 38.2208; -84.85757, 38.22074; -84.85704, 38.22075; -84.85605, 38.22083; -84.85302, 38.21931).

Parcel 3: Parcel # 073-00-00-049

Deedbook 454 pg 53

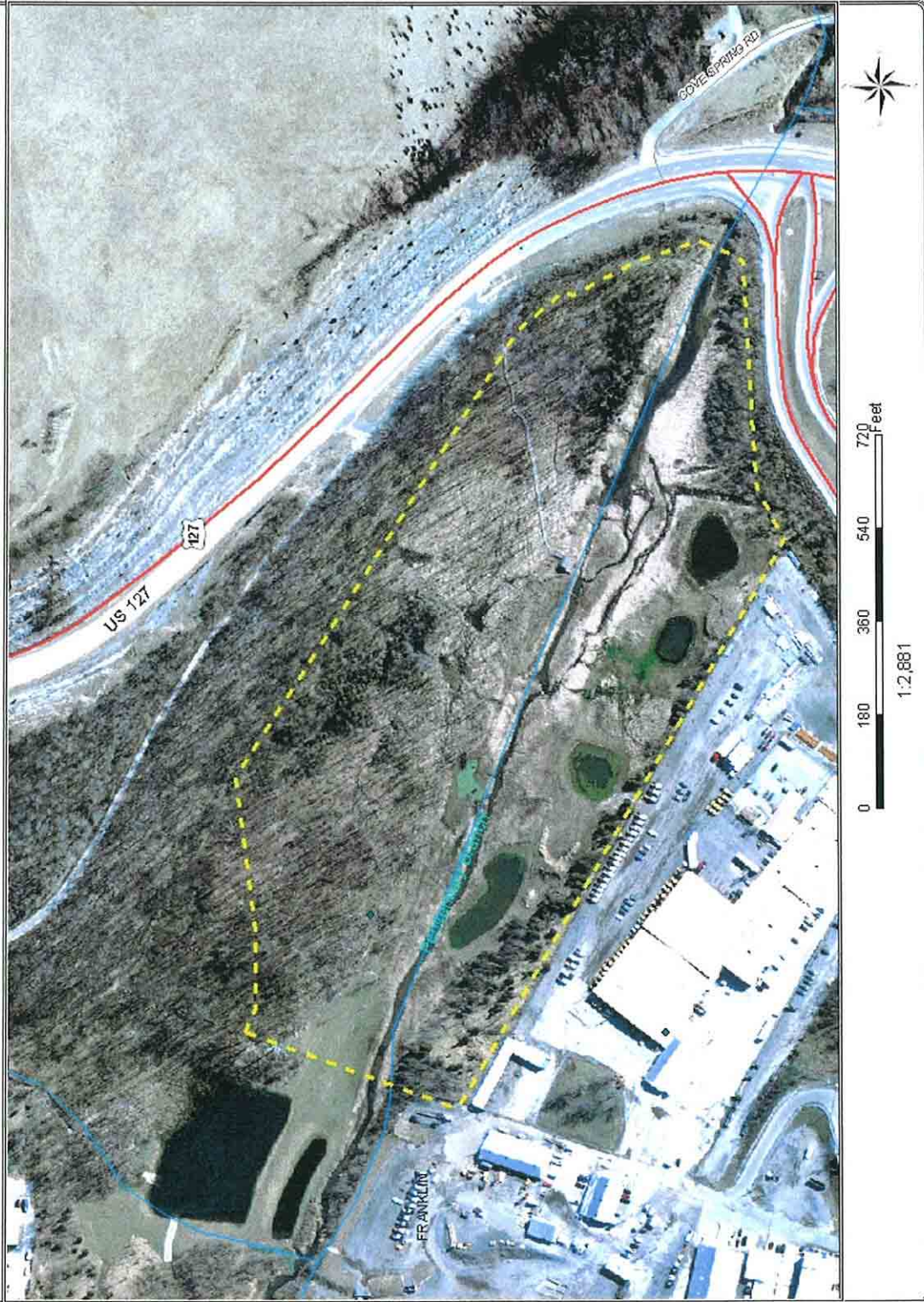
The project area includes the stream bed and property adjacent to each side of Cove Spring Branch and Holly Branch (*see Parcel 3 Map*). The project area is 7.17 acres in area and measures approximately 80 feet wide and is centered on the stream channel. The project area begins at the southwestern property boundary and runs 3900 feet upstream on Cove Spring Branch. The area also includes 175 feet of Holly Branch immediately upstream of its confluence with Cove Spring...The easement width is variable throughout the stream length to accommodate existing features of the park such as the waterfall platform and existing infrastructure.

Parcel 1 Map



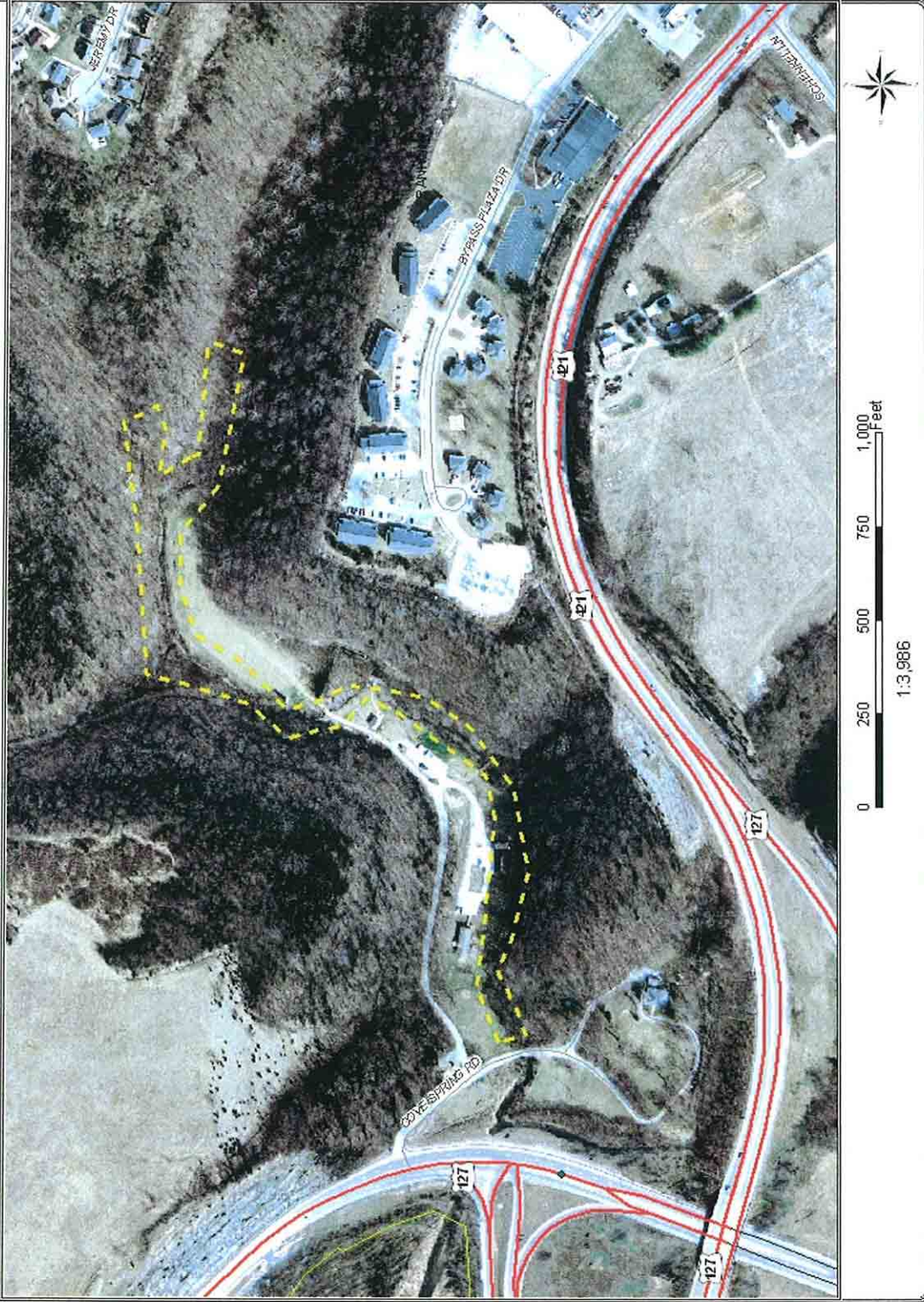
Parcel 1 Map showing outlines of easement area (dashed line). Map not drawn to scale

Parcel 2 Map



Parcel 2 Map showing outlines of easement area (dashed line). Map not drawn to scale

Parcel 3 Map



Parcel 3 Map outlines easement area in yellow. Property Boundaries are shown in pink. Map is not drawn to scale.



Overview Map showing location of parcels within Cove Spring Park, Frankfort, KY. Map is not drawn to scale.

DEED OF CONSERVATION EASEMENT

THIS DEED OF CONSERVATION EASEMENT is entered into by and between the H.G. Mays Corporation, 350 Lewis Ferry Rd., Frankfort, KY 40601 (hereinafter "Grantor") and COMMONWEALTH OF KENTUCKY, for the use and benefit of the Tourism, Arts and Heritage Cabinet, Department of Fish and Wildlife Resources, 1 Sportsman's Lane, Frankfort, KY 40601, by and through Jonathan Miller, Secretary, Finance and Administration Cabinet, (hereinafter "Grantee").

WITNESS THAT:

WHEREAS, the Grantor is the landowner of certain real property (hereinafter "Project Area") located in Franklin County, Kentucky, and more particularly described in the "Project Area Description" attached hereto and incorporated herein as Exhibit A; and

WHEREAS, the Project Area will be improved by creating better access to a floodplain, bank stabilization, establishment of riparian zone, and creating better aquatic habitat; and

WHEREAS, the remainder of the Project Area remains in a substantially undisturbed, natural state and has significant value as stream habitat; and

WHEREAS, the Grantee is a governmental body empowered to hold an interest in real property under the laws of the Commonwealth of Kentucky and the United States and, therefore, qualifies as a holder pursuant to KRS 382.800; and

WHEREAS, both Grantor and Grantee desire to retain and protect the natural, scenic, and open-space values of the Project Area, and assure the Project Area's availability for agricultural, forest, recreational, and open-space use, protecting natural resources, maintaining or enhancing air or water quality, or preserving the historical, architectural, or cultural aspects of the Project Area; and

WHEREAS, KRS 382.800 through KRS 382.860 permits the creation of conservation easements for the purposes of, inter alia, retaining land or water areas predominantly in their natural, scenic, open or wooded condition or as suitable habitat for fish, plants, or wildlife and to insure that the areas will be available for agricultural, forest, recreational, educational, or open-space use; and

NOW, THEREFORE, in consideration of the mutual covenants contained herein; and further, pursuant to KRS 382.800 through 382.860, Grantor does hereby convey to Grantee a Conservation Easement (hereinafter "Easement") in perpetuity over the Project Area to be held for the benefit of the people of the Commonwealth of Kentucky and consisting of the following:

- (1) The Project Area shall be maintained in perpetuity for the following purpose:
 - stream habitat
- (2) Grantee shall manage the Project Area in strict accordance with:
 - (a) KRS Chapter 150
 - (b) KRS 382.800 through 382.860, and
 - (c) The detailed channel design plan pertaining to the Project Area which has been generated by the Grantee, attached hereto as Exhibit "A".
- (3) The Grantee has the right of visual access to and view of the Project Area in its natural, scenic, open and undisturbed condition.
- (4) The Grantee has the right to enter the Project Area, in a reasonable manner and at reasonable times, for the purposes of management and construction of the project. These purposes shall also include inspection of the Project Area to determine compliance with this Easement and to repair any damages to the area, thus ensuring that the project remains in compliance with this Easement.
- (5) There shall be no removal, destruction, cutting, trimming, mowing, alteration, or spraying with biocides of any vegetation, nor any disturbance or change in the natural habitat within the Project Area in any manner unless addressed in the final design plan or specifically authorized by the Grantee.
- (6) There shall be no planting or introduction of any species of vegetation within the Project Area unless addressed in the final design plan or specifically authorized by the Grantee.
- (7) There shall be no harvesting of timber within the Project Area unless addressed in the final design plan or specifically authorized by the Grantee.
- (8) There shall be no commercial or industrial activity undertaken or allowed within the Project Area, nor shall any right of passage across or upon the Project Area be allowed or granted if that right of passage is used in conjunction with commercial or industrial activity. (KRS 382.800(1) clearly references agricultural usage.)
- (9) Grantor shall be allowed to remove trash and debris from the Project Area.

- (10) Except as deemed necessary by the Grantee in completing the channel design plan, there shall be no filling, excavation, or dredging within the Project Area.
- (11) There shall be no mining or drilling within the Project Area.
- (12) There shall be no removal of topsoil, sand, gravel, rock, minerals or other materials within the Project Area without consent of KDFWR.
- (13) There shall be no dumping of ashes, trash, garbage, or any other material within the Project Area.
- (14) There shall be no changing of the topography within the Project Area in any manner without consent of KDFWR.
- (15) There shall be no construction or placing of temporary or permanent buildings, mobile homes, advertising signs, billboards, or other advertising material, or other structures within the Project Area.
- (16) Except with the written consent of the Grantee, there shall be no building of new roads, trails, or other rights of way within the Project Area. Existing trails and roads may be maintained by reasonable means consistent with the purposes of this Easement
- (17) There shall be no introduction of non-native wildlife as defined by 301 KAR 2:081 and 301 KAR 1:122 into the Project Area without the written consent of the Grantee. (Plants are covered in paragraph 6.)
- (18) Except as deemed necessary by the Grantee in completing the channel design plan, there shall be no damming, dredging or construction in any free-flowing water body, nor construction of any weirs, groins, or dikes in any wetlands, or any manipulation or alteration of natural water courses, fresh water lake or pond shores, marshes, wetlands, or other water bodies nor any activities or uses detrimental to water purity within the Project Area.
- (19) Except as deemed necessary by the Grantee in completing the channel design plan, there shall be no operation of mechanical or motorized vehicles within the stream channel, not including designated crossings. Mechanical or motorized vehicles shall cross perpendicular to the channel, as opposed to, driving the vehicle up and down the length of the stream.
- (20) Where applicable, there shall be no destruction of fencing placed within the Project Area. After the five-year monitoring period the

Grantor agrees to maintain the fence in a condition that equal or better than its condition when received from the Grantee.

- (21) Any use of the Project Area or any activity thereon which, in the opinion of the Grantee, is or may become inconsistent with the purpose of this Easement, which is the preservation of the area in its natural and undisturbed condition for the purposes set out in KRS 382.800(1) and the management and protection of its environmental systems, is prohibited.
- (22) In the event of a violation of any term, condition, or restriction contained in this Easement, the Grantee may immediately enforce any of the remedies available to it under this contract or by law. Any failure by the Grantee to avail itself of these remedies shall not be deemed to be a waiver or forfeiture of the right to enforce any term, condition, covenant or purpose of this Easement.
- (23) In the event that damage is caused to the Project Area by a deliberate, reckless or negligent act of Grantor, its successors, or assigns, then Grantor shall be responsible for the reasonable costs of remediation.
- (24) This Easement shall be a burden upon and shall run with the Project Area in perpetuity and shall bind the Grantor, its successors and assigns forever, except upon written notice of abandonment of the project by Grantee to Grantor.
- (25) The rights herein granted shall be in addition to, and not in limitation of, any other rights and remedies available to the Grantee for protection of the Project Area.
- (26) This easement does not grant access to the property by the general public.
- (27) Grantor agrees to indemnify and hold harmless Grantee, its agents, officers and assigns from any claims arising from injury or damages resulting from any negligent actions of the Grantee, its agents, officers, or employees.
- (28) Neither Grantee nor Grantor shall be responsible for acts by third parties.
- (29) In the event that the project is not implemented, this Easement shall become null and void.
- (30) Grantee shall have no duty to maintain this Project Area after five years from the date of completion of the project unless otherwise required by statute.

IN WITNESS WHEREOF, the _____, Grantee, accepts this deed of conservation easement this _____ day of _____, 20____.

Authorized Representative of Grantee

COMMONWEALTH OF KENTUCKY)

COUNTY OF _____)

I, the undersigned, a notary public duly authorized in the county and state aforesaid, do hereby certify that on this day _____ personally appeared before me and executed the foregoing instrument as _____ of _____, and acknowledged before me that he executed the same as such officer in the name of and for and on behalf of the said entity.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal, this _____ day
of _____, 20____.

Notary Public, State-at-Large

My Commission expires _____

APPROVED:

COMMONWEALTH OF KENTUCKY

By: _____
Jonathan Miller, Secretary
Finance & Administration Cabinet

REVIEWED & APPROVED AS TO FORM & LEGALITY:

Patrick McGee, Assistant General Counsel
Legal & Legislative Services

COMMONWEALTH OF KENTUCKY)

COUNTY OF FRANKLIN)

The foregoing was acknowledged before me on this _____ day of _____, 20____, by Jonathan Miller, Secretary of the Finance and Administration Cabinet.

Notary Public, State-at-Large

My Commission expires _____

THIS INSTRUMENT PREPARED BY:

Nick Ozburn
Fisheries Division
#1 Sportsman's Lane
Frankfort, KY 40601

EXHIBIT "A"

Project Area Description

The "Project Area" referenced in the conservation easement is described as follows:

H.G. Mays Corporation

Parcel # 073-00-00-034

Deedbook: 346 pg. 424

The project area includes the stream bed and property adjacent to each side of Penitentiary Branch (*see Map*). The project area is 6.75 acres in area and shall extend to the eastern, western, and southern property boundaries. It shall extend northward from the centerline of the constructed stream channel for an average of 175 feet (ranging from 10-300 feet depending on location). The northern extent of the project area follows a line on coordinates (-84.86302, 38.21911; -84.86268, 38.2194; -84.86248, 38.21945; -84.86234, 38.21984; -84.86202, 38.22017; -84.86198, 38.22098; -84.86068, 38.22129).

H.G. Mays Easement Area



Map showing easement area for stream and wetland restoration project. The northern property boundary is a dashed pink line. The East, West, and South easement boundaries run along the property boundaries denoted by double yellow lines.

Attachment 10

USACE Ponding Easement Coordination

Zimmerman, Joseph (FW)

From: Alvey, Chris R LRL [Chris.R.Alvey@usace.army.mil]
Sent: Wednesday, August 15, 2007 1:10 PM
To: Jeff Hackbart
Cc: Acammack@fewbp.net; Zimmerman, Joseph (FW); Frank, Daniel D LRL
Subject: RE: Cove Spring Stream Restoration Project

Jeff, our Hydraulics Branch has reviewed the conceptual plan and concluded the impact of the proposed work would be very minimal in regards to the capacity of the ponding area. We currently have no objection to this conceptual plan but please remember we need to review and approve the final plans prior to any work in the ponding area.

Thanks.

Chris Alvey
U.S. Army Corps of Engineers
Emergency Management
and Security Branch
P.O. Box 59
Louisville, KY 40201
Office: 502-315-6764
Cell: 502-558-9566
Fax: 502-315-6918

-----Original Message-----

From: Jeff Hackbart [mailto:JHackbart@frankfort-ky.gov]
Sent: Monday, August 06, 2007 11:42 AM
To: Alvey, Chris R LRL
Cc: Acammack@fewbp.net; joseph.zimmerman@ky.gov
Subject: Fwd: Cove Spring Stream Restoration Project

Chris,

Attached is a conceptual plan that the City of Frankfort and the KY Fish and Wildlife Department is working on. The City wishes to restore the Penitentiary Branch stream that runs through the Jones Run Floodwall system. The project will create a meandering stream through the Cove Spring Park area (the stream flows within the Jones Run Ponding Easement). I have talked with Joseph Zimmerman with the Fish and Wildlife Depaertment about the City's past concerns relating to ponding capacity. He indicates that the plan will not diminish ponding capacity behind the floodwall but will focus on improving water quality of the watershed.

Would the Corps of Engineers review the attached preliminary plan and provide some feedback during the early stages of this project. thanks

my new e-mail address is: JHackbart@Frankfort-ky.gov

Jeff Hackbart, P.E.
Public Works Director/City Engineer
502-352-2091 phone
502-875-8502 fax
PO Box 697
Frankfort, KY 40602